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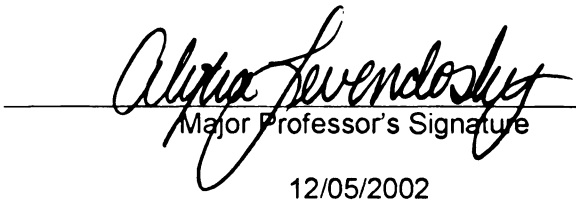

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THE IMPACT OF COMMUNITY VIOLENCE ON INFANTS' SOCIAL AND EMOTIONAL COMPETENCE

By

Kerry Lynn Kelly

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ABSTRACT

THE IMPACT OF COMMUNITY VIOLENCE ON INFANTS' SOCIAL AND EMOTIONAL COMPETENCE

By

Kerry Lynn Kelly

The present investigation employed an ecological framework in the study of domestic violence. Specifically, the study examined the impact of community violence, an *exosystem* variable, on domestic violence, a *microsystem* factor, and the individual functioning of infants, an understudied population. Community violence was expected to have a significant, negative influence on infant mental health. Participants included a community sample of 94, 12-month-old infants and their mothers living in a Midwestern, metropolitan area. Domestic violence, maternal mental health, and infant social and emotional competence were assessed by maternal report. Community violence, defined as the average proximity to all police incidents of violent crime occurring within the community where the infant lives, was assessed using Geographic Information Systems technology. Structural equation modeling results revealed that community violence directly increases infants' social and emotional behavior problems, the occurrence of domestic violence, and maternal mental health problems. Results also indicated that maternal mental health mediates the relationship between community violence and infant functioning, as well as the relationship between domestic violence and infant adjustment. The importance of developing and testing contextual models in the study of domestic violence is emphasized.

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KEY FOR MODELS

Community Violence

Police Data	Incidents of Violent Crime	*commvio*

Maternal Mental Health Problems

BDI	Depression	*matdepre*
BSI –A	Anxiety	*matanxty*
PTSD	Posttraumatic Stress Disorder	*matptsd*

Infant Socio-Emotional Problem Behaviors

ITSEA

Activity	*infact*
Aggression	*infagg*
Peer Aggression	*infpee*
Negative Emotionality	*infneg*
Depression/Social Withdrawal	*infdep*

Domestic Violence

SVAWS

Psychological Abuse	*psyabuse*
Physical Abuse	*phyabuse*
Sexual Abuse	*sexabuse*

Literature Review

The current project is the first known effort to examine the impact of community violence (including all police incidents of community violent crime) on infant's experiences of domestic violence (DV; defined here as male violence against female romantic partners) and social and emotional development. Thus far, research on the impact of DV on children's mental health has focused primarily on individual and family factors that affect the adjustment of preschool and school-aged children. Infants exposed to DV have virtually been ignored, as have the effects on mental health of living in a neighborhood with high levels of violence. In contrast, research on child maltreatment has begun to include community violence as an additional risk factor for children's functioning.

Several researchers have proposed an ecological/transactional model of individual functioning and psychopathology, which emphasizes the importance of examining all levels of the environment within which an individual lives (Belsky, 1980; Bronfenbrenner, 1977; Cicchetti & Lynch, 1993). The ecological framework includes four nested levels of ecology, each varying in proximity to the individual, and each containing risk and protective factors that influence both the individual and neighboring social contexts. Moving from the proximal to the more remote contexts, the *ontogenic* level includes the individual and his or her own development; the *microsystem* consists of the individual's immediate settings, such as the family, workplace, and school; the *exosystem* includes other social structures, which encompass the immediate settings in which the individual lives, such as the neighborhood and community; and finally, the *macrosystem* consists of the beliefs and values of the individual's culture. All four levels

of ecology interact and influence each other in shaping an individual's development and adaptation.

A comprehensive understanding of human development requires that researchers move beyond the immediate contexts to assessing more distal aspects of the individual's environment. Yet, nearly all research on the impact of DV on children's mental health has depended on individual- (*ontogenic*) and family-level (*microsystem*) factors that affect individual development, while ignoring the influence of both community- (*exosystem*) and societal-level (*macrosystem*) variables. The current study is an initial attempt to incorporate the *exosystem* in a contextual model of DV which considers the mental health effects of both living in a violent home and in a violent community on infants, an understudied population (see Figure 1 for hypothesized conceptual model). The model includes a hypothesized direct, negative effect of community violence on the social and emotional competence of infants aged 12 months. Specifically, the study considers five developmental outcomes: activity level, aggression/defiance, peer aggression, emotional negativity, and depression/social withdrawal. In addition, DV and maternal psychological health (*microsystem* factors) are tested as mediators of the hypothesized relationship between community violence and infant functioning.

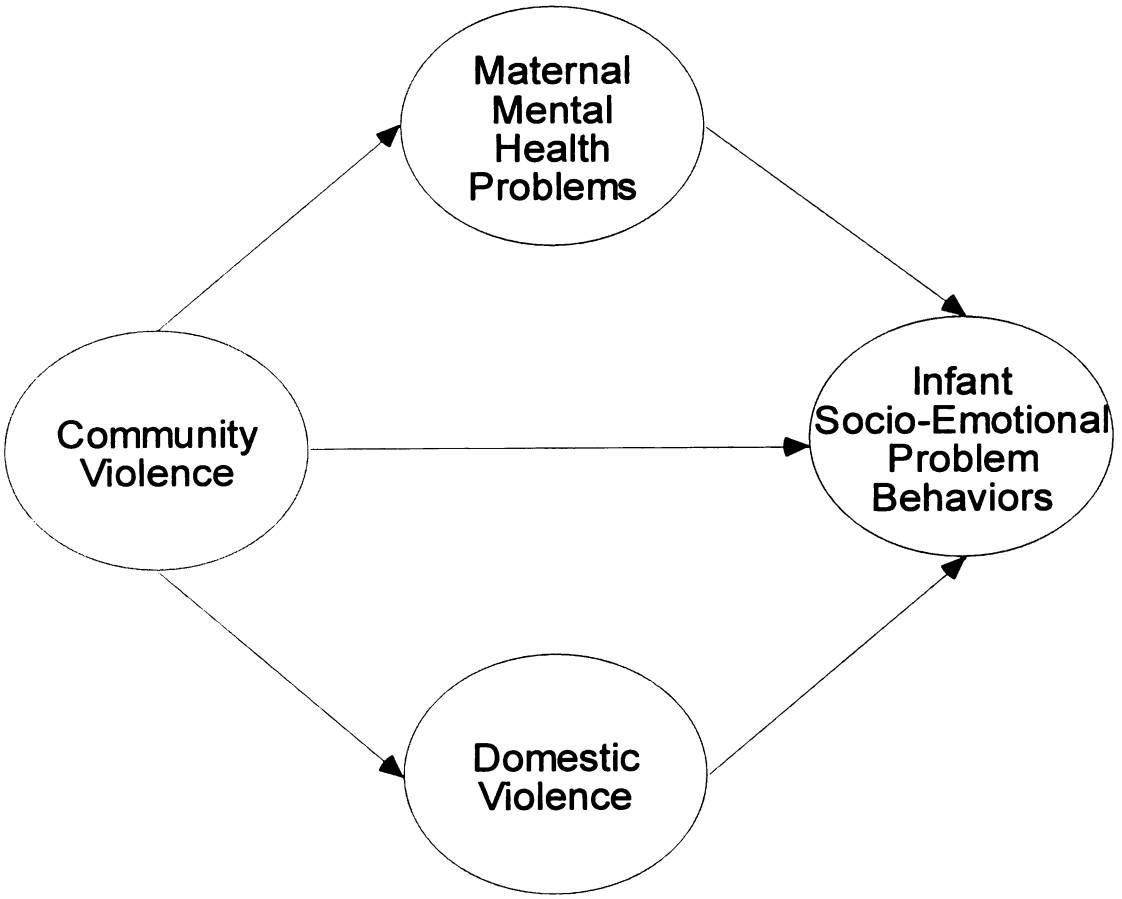

Figure 1. Hypothesized conceptual model.

Problem of Domestic Violence (DV)

Reported rates of domestic violence appear to be on the decline since DV first came to the public's attention in the 1970's. Based on the results of two national surveys, Straus and Gelles (1986) reported that violence against women decreased from 1975 to 1985 by 27 percent. Data from the National Crime Victimization Survey resulted in similar findings, indicating that the number of female victims of DV decreased from 1993 to 1998 (Rennison & Welchans, 2000). Taken together, these findings suggest that increased public attention to DV and, therefore, increased resources aimed at reducing spousal violence have been moderately successful. Despite efforts to intervene in intrafamily conflict, however, DV remains an important criminal justice concern and public health problem with an estimate of over 1.5 million women beaten by an intimate partner annually in the United States (Straus & Gelles, 1986; Tjaden & Thoennes, 2000). Because most victims are battered on more than one occasion, the number of victimizations exceeds the number of victims, with an estimated 4.9 million intimate partner rapes and/or physical assaults perpetrated against women each year in the U.S (Tjaden & Thoennes, 2000).

Although DV certainly has implications for the physical and psychological health of battered women, intimate partner violence also affects exposed children. Unfortunately, violent families tend to have more children than nonviolent families (Graham Bermann, 1996; Wolfe, Jaffe, Wilson, & Zak, 1985). In a study on child witnesses of DV, almost 60% of the battered women had 3 or more children (Lehmann, 1997). And battered women report that, in 90% of the cases, their children are either in the same or next room when their partners assault them (Hughes, 1988; Rosenberg &

Rossman, 1990). Straus (1991) estimated that 10 million children in the United States witness DV against their mothers each year. In one study, 70% of the children reported directly seeing DV, while the remaining 30% reported hearing it (Graham Bermann & Levendosky, 1998). Thus, even if children do not see DV, they are still aware that it is occurring and could be affected.

Many children living in DV households are often more involved than just seeing or hearing DV. Fantuzzo, Boruch, Beriama, Atkins, & Marcus (1997) found that many children living in DV families were literally calling for help, being identified as the cause of the argument by the parents, and/or were the targets of child abuse. Several studies indicate a high concordance between DV and child maltreatment. For example, a study of Australian children found that 65% of children exposed to DV were also involved as direct victims of verbal, physical, or sexual abuse (Mathias, Mertin, & Murray, 1995). Likewise, Rosenbaum and O'Leary (1981) found that 82% of men who report witnessing DV between their parents also report experiencing child abuse. Finally, another study found that 26% of children exposed to DV were also abused within the last year (Christopoulos, Cohn, Shaw, Joyce, & et al., 1987). This estimate may be low, however, as it was based on reports from mothers who may have been reluctant to report child abuse.

Children are emotional victims, if not physical victims of DV and, therefore, may suffer consequences from exposure to intimate partner violence. However, children did not appear in the DV research literature until the 1980's and even now, findings regarding the impact of DV on children's adjustment are inconsistent (Christopoulos et al., 1987; Levendosky, Huth-Bocks, Shapiro, & Semel, 2000; Wolfe et al., 1985; Wolfe,

Zak, Wilson, & Jaffe, 1986). In addition, there are few laws to protect children exposed to DV (Fantuzzo, Mohr, & Noone, 2000). And children's safety is often ignored as evidenced by the shift to parental rights and preference for joint custody, despite the fact that DV may be present in many cases (Pagelow, 1990). Furthermore, research examining the impact of DV on preschool children is limited, and virtually nonexistent for infants, even though young children are more likely to be exposed to DV than older children. One study found that children, especially under the age of 5, are disproportionately present in households where there was a substantial amount of DV (Fantuzzo, Boruch, Beriama, & Atkins, 1997). Another study found that physical violence between partners is inversely related to age, such that young couples who are most likely to have young children report the highest levels of DV (Straus, Gelles, & Steinmetz, 1980). Furthermore, young children may be exposed to more severe forms of DV. A longitudinal study of couples showed that overall high rates of DV were most intense during the early stages of the relationship (O'Leary et al., 1989), which is often when couples have young children.

Impact of DV on Children's Mental Health

Infants

Despite the prevalence of infants living in homes with DV, few empirical studies have examined the influence of DV on infant and toddler functioning. Layzer, Goodson, and deLange (1986) examined physical health and behavior problems in infants residing in battered women's shelters. Over half of these infants demonstrated weight and eating disturbances, difficulty sleeping, and did not react normally to adults. Approximately 70% of the infants over 18 months of age exhibited disturbances in mood and problems

with social interaction. Clinical reports offer similar findings, suggesting that infants who witness intimate partner violence against women have poor physical health, bad sleeping habits, are highly irritable, and display high rates of screaming and crying (Alessi & Hearn, 1984). Finally, preliminary evidence from a small sample of children under age 4 indicates that young children exposed to DV may suffer from posttraumatic stress disorder (Scheeringa, Zeanah, Drell, & Larrieu, 1995).

A few studies have examined the impact of nonviolent marital conflict on infants' adjustment. Young children, ages 12-36 months, with difficult temperament exhibited strong, negative reactions to marital disputes (Easterbrooks, Cummings, & Emde, 1994). Another study conducted by Cummings, Zahn-Waxler, and Radke-Yarrow (1981) found that infants aged 10-20 months exposed to frequent interparental anger were more likely to exhibit signs of anger, distress, or attempts to comfort or settle their angry parents compared to infants exposed to infrequent anger between their parents.

Studies of normal infant development suggest that infants under 12 months can discriminate facial and vocal emotional expressions, and infants 6 months and older can use others' vocal and facial expressions to judge situations (Walker Andrews, 1997). Thus, even during the first year of life, infants have the ability to detect the anger and distress of their parents during interspousal violence, which may affect their continuing development. The present study adds to the current literature by examining the impact of DV on infant adjustment.

Preschool and School-aged Children

Externalizing and internalizing behavior. Although literature concerning infants and DV is scant, research findings suggest that exposure to DV, a *microsystem* factor, has

implications for the healthy development of preschool- and school-aged children. Child witnesses of DV suffer from problems similar to those of maltreated children. For example, Jaffe, Wolfe, Wilson, and Zak (1986) report that both children who witness DV (ages 4-16) and abused children (ages 6-16) suffer from more externalizing and internalizing problems than a community comparison group (ages 6-16). Common problems included clinging to caregivers, loneliness, feeling unloved, unhappiness, sadness, jealousy, worrying, disobedience, lying, cheating, destroying property, cruelty towards others, fighting, and interactions with deviant peers. Furthermore, children who were either exposed to violence or abused directly suffered from more severe forms of adjustment problems with 90% of abused and 75% of exposed children exhibiting clinically significant behavior problems.

Studies of children who witness DV, but who are not necessarily victims of child maltreatment, suggest that children of battered mothers are at a high risk for behavior problems and often have clinically significant adjustment problems (Fantuzzo et al., 1991; Graham Bermann, 1996; Wolfe et al., 1985). As marital discord itself is a strong predictor of child behavior problems (Pepler, Catallo, & Moore, 2000), Rosenbaum and O'Leary (1981) compared children who witnessed DV to both children of satisfied couples and to children with maritally discordant, yet nonabusive parents to determine if the increased likelihood of behavior problems among children who witness DV is due to violence and not simply a function of an unhappy marriage. The researchers report that school-age children who witness violence between their parents are more likely to score in the clinical range on conduct and personality disorders than school-age children of happily and unhappily married parents. These findings suggest that children's deviance

may, indeed, be a function of witnessing DV. Clinical observations also suggest that school-age children of battered mothers suffer from internalizing and externalizing problems, including anxiety, depression, fighting, impulsivity, and disobedience (Moore, Pepler, Mae, & Michele, 1989).

Cross-cultural research supports these findings, indicating that children from backgrounds of DV function at a lower level than children living in nonviolent homes. In a study conducted on Australian children, Mathias et al. (1995) found that 6- to 12-year-old children exposed to DV suffer from more emotional and behavioral problems, are more withdrawn and depressed, express more somatic complaints, and exhibit more delinquent and aggressive behavior than children not exposed to DV. A study of 110 8- to 12-year-old Israeli children revealed similar results with child witnesses of DV admitting that they were more likely to behave in ways likely to get them into trouble. They also felt sad and rejected more often than children from nonviolent homes (Sternberg, Lamb, & Dawud Noursi, 1997).

In order to gain a deeper understanding of the internalizing symptoms of children living in domestically violent families, Graham-Bermann (1996) assessed the targets of children's worry and the specific types of behavior children worry about. According to child reports, school-age children exposed to DV are significantly more worried about the vulnerability of their mothers and siblings than children not exposed to DV, and are more likely to worry about the harmful behavior of their fathers. Furthermore, adjustment problems, specifically anxiety and depression, of children of battered mothers are significantly related to worry about the harmful behavior of family members. Another study of 8- to 14-year-old children provided similar results, suggesting that witnessing

DV is related to a child's fear that a parent will be hurt or killed, as well as a child's self-blame that he or she is contributing to or failing to prevent interparental violence, all of which may result in anxiety, depression, and feelings of hopelessness and low self-worth (Grych, Jouriles, Swank, McDonald, & Norwood, 2000).

Although several studies suggest that children exposed to DV exhibit elevated levels of externalizing and internalizing behavior problems, findings are inconsistent. Christopoulos et al. (1987) found that 5- to 13-year-old children exposed to DV suffer from significantly more internalizing problems than a community sample but not externalizing problems. Thirty-three percent of the children exposed to DV, however, scored in the clinical range on externalizing and internalizing behavior problems as compared to 17.5% and 10% of the community sample, respectively. In contrast, another study found that preschool children exposed to DV displayed elevated levels of externalizing problems, but not internalizing problems (Levendosky et al., 2000). Finally, one study suggests that children exposed to DV do not exhibit more behavior problems than children not exposed to DV. Although Wolfe et al. (1986) found that 4- to 13-year-old children recently exposed to DV display fewer interests and participate in fewer social activities according to maternal report, these children did not show significantly more behavior problems than children from nonviolent families. This study, however, is in contrast with the majority of the DV research.

Social competence. Findings on children's social competence are similarly unclear. Both clinical observations and empirical studies suggest that school-age children who have witnessed DV have diminished social competence, including difficulty interacting with peers and adults, difficulty solving social problems, and trouble

generating appropriate solutions to social conflict (Mathias et al., 1995; Moore et al., 1989; Wolfe et al., 1985; Wolfe et al., 1986). However, Jaffe et al. (1986) found no group differences in social competence between boys who witnessed DV (ages 4-16) and a community sample of boys (ages 6-16). Similarly, Christopoulos et al. (1987) report no differences in perceived competence between school-aged children living in violent families and those living in nonviolent homes. This study may have been methodologically flawed, however, as almost half of the women in the comparison group in this study reported mild DV, such as pushing and throwing.

Traumatic stress. In addition to behavior problems and problems in perceived competence, several studies indicate that children living in violent homes experience trauma symptoms. Lehmann (1997) found that 56% of a sample of 84 child witnesses of DV (ages 9-15) met the criteria for PTSD. This estimate may be high, however, as these children were all living in a shelter at the time of assessment and thus, traumatic symptoms may be partially the result of relocating or being separated from family, friends, and school. It is also possible that shelter children have been exposed to more severe violence than those whose mothers do not have to seek shelter. Therefore, estimates based on community samples of children may be more accurate.

Graham-Bermann and Levendosky (1998) report that 13% of a community sample of 7- to 12-year-old children living in DV homes met criteria for PTSD as defined by the DSM-IV. Despite the low rate of children meeting the diagnostic criteria for PTSD, the majority of these children suffered from traumatic stress symptoms with 52% meeting the criteria for re-experiencing symptoms, 19% meeting the criteria for avoidance symptoms, and 42% for hyperarousal. A study of preschool-age children

found similar results, indicating that between 3% and 24% of a community sample of child witnesses of DV met criteria for a PTSD diagnosis depending on the measure used to assess symptomatology (Levendosky, Huth-Bocks, Semel, & Shapiro, 2002). Although few met diagnostic criteria, all of the children expressed at least one trauma symptom with the most common being re-experiencing and hyperarousal. It is possible that children exposed to DV actually suffer from PTSD at higher rates than reported in these studies because diagnoses were determined using adult criteria for PTSD, and child responses to trauma may be qualitatively different than those of adults. For example, children may react to violent trauma by clinging to their caregivers instead of engaging in avoidant behaviors as adults commonly do (Graham Bermann & Levendosky, 1998; Levendosky et al., 2002).

Regardless of the rates of PTSD in children exposed to DV, trauma symptoms are associated with increased severity (Levendosky et al., 2002), duration, and frequency of mother assault (Lehmann, 1997). Furthermore, PTSD symptoms, specifically intrusive, re-experiencing symptoms, are associated with child externalizing problems (Levendosky et al., 2002).

Explanations for diverse findings. In order to account for the diversity of findings linking DV and child adjustment problems, Grych et al. (2000) hypothesized that children exposed to DV exhibit several different profiles of functioning. To test their assertion, the researchers used cluster analysis to identify five distinct patterns of adjustment among a sample of 228 8-to 14-year-old children living in a shelter for battered women: no problems, multiproblem-externalizing, externalizing, mild distress, and multiproblem-internalizing. Although one-third of the children showed no signs of maladjustment, one-

third exhibited both internalizing and externalizing problems falling onto one of the two multiproblem groups. The researchers also examined factors that predicted adjustment patterns, finding that both multiproblem groups had higher child reports of exposure to DV, suggesting that frequency of exposure is related to problematic behavior. In addition, children's perceptions and appraisals of DV differed across the groups, such that both multiproblem groups and the mild distress group feared that a parent would be hurt or killed, and felt responsible for either causing or failing to prevent the conflict between their parents.

Determining distinct patterns of adjustment among children of battered mothers may account for the inconsistent findings regarding the impact of DV on children. Alternatively, it is possible that poor methodology contributes to the discrepant findings. For example, many studies on DV and children utilize shelter samples of children, which may compromise the external validity of results. One study suggests that adjustment problems may be related to shelter residence. Fantuzzo et al. (1991) compared DV families living in a shelter, DV families living at home, and nonviolent families. Although both shelter children and children living in DV homes (ages 3-6) exhibited more adjustment problems than those children living in nonviolent families (ages 3-6), when the contribution of aggression to behavior problems was statistically removed, all significant group differences for externalizing problems as well as differences between home violence and control groups in internalizing problems disappeared. However, those children living in shelters for battered women still displayed significantly higher levels of internalizing behavior problems and poorer social adjustment. These results suggest that

children living in shelters may have a distinct set of problems that may or may not be related to DV and, thus, may not be representative of all children exposed to DV.

Although there are a diversity of findings concerning DV and children's adjustment, the majority of the research literature indicates that preschool- and school-aged children suffer from a myriad of mental health problems, including internalizing and externalizing behavior problems, diminished social competence, and PTSD. However, it remains unknown whether infants exposed to DV suffer similar consequences as older children with battered mothers. The present project adds to the sparse research literature regarding infants and DV. In addition, the current study uses a community sample of infants to increase the generalizability of results.

Impact of Maternal Psychological Functioning on Children's Mental Health

In addition to the presence of domestic violence, poor maternal mental health, an additional *microsystem* factor, may negatively affect infants' social and emotional development. Crnic, Greenberg, Robinson, and Ragozin (1984), in a longitudinal investigation of mother-infant pairs, found evidence suggesting that maternal psychological functioning may have consequences for 1- to 18-month-old infants' adjustment. The researchers found that maternal stress impacts mothers' satisfaction with parenting and child-rearing attitudes, such that the more negative life stress a mother experiences, the less satisfied she is with her parenting and the more negative she is toward raising children. Furthermore, mothers experiencing negative life stress were less responsive than those experiencing less stress; maternal stress at one-month post-partum predicted mother's sensitivity to infants' cues at four months (Crnic et al., 1984).

Although not examining infants, several studies suggest that maternal mental health, in the context of DV, negatively impacts children's adjustment. For example, a study examining the mother-child relationship in the context of family violence found that the most troubled children of those who witnessed DV in their families were those whose mothers were depressed and aggressive towards them (Pepler & Moore, 1995). Another study found that factors associated with maternal stress, including poor mental health, accounted for almost 20% of the variance in school-age children's adjustment (Wolfe et al., 1985). In addition, maternal stress accounted for a significant proportion of variance in child behavior problems and social competence over and above DV. Conversely, DV accounted for a nonsignificant amount of variance in children's adjustment when controlling for maternal stress (Wolfe et al., 1985). These results imply that the impact of children witnessing DV may be partially a function of mothers' impairment as a result of being battered. Finally, in a study examining preschool children and mothers exposed to DV, researchers found that the negative impact of DV on children's behavior resulted, in part, from the mediation of maternal psychological functioning (Levendosky et al., 2000). Furthermore, the researchers found that depressed and traumatized battered women reported lower parenting effectiveness than well functioning women (Levendosky et al., 2000).

Although research suggests that maternal stress impacts parenting and child adjustment, and maternal mental health has been shown to partially mediate the relationship between DV and children's adjustment, no known study to date has examined the impact of maternal psychological functioning on infant behavioral outcomes in the context of DV. The present study adds to the existing literature by

including a direct path between maternal psychological functioning and infant socio-emotional development in the hypothesized model (see Figure 1).

Systems Theory

While studies document the negative impact of DV and maternal mental health, both *microsystem* variables, on children's functioning, DV researchers have yet to consider broader ecological forces. Systems theory provides a theoretical basis for assessing the *exosystem* in the conceptualization of domestic violence. General systems theory was first proposed in the 1940's by biologist Ludwig von Bertallannffy as an attempt to encourage a comprehensive theoretical model embracing all living systems (Goldenberg & Goldenberg, 1996). By focusing attention on the pattern of relationships within or between systems, as opposed to studying the individual in isolation, Bertallannffy's theory was seen as widely applicable to the social sciences. Systems theory has emerged as an overall concept which encompasses principles from both general systems theory and cybernetics, and focuses on the relationship between elements rather than just the elements themselves (Goldenberg & Goldenberg, 1996). Systems theory considers the family as a system, as well as other larger social systems in which the family is embedded, such as the peer system and the outside world, including the community and culture (Wagner & Reiss, 1995). As nobody exists in isolation, emphasis is on the transactions taking place among systems, as opposed to the separate qualities or characteristics of an individual. In other words, systems theory proposes a broader examination of the ongoing context in which current individual or family dysfunction occurs. Thus, psychopathology is conceptualized as having multiple causes at various levels.

The systems themselves are organized and have boundaries, and each higher-level system encompasses all lower-level ones, such that the systems are organized hierarchically (Napier & Whitaker, 1978). Nevertheless, each system influences and responds to each other system. Because individual behavior can only be understood in the context of larger systems (Wagner & Reiss, 1995), one must integrate knowledge from many different levels to understand individual functioning. Thus, in order to understand the impact of DV on infant's adjustment, one must also consider the larger community in which the family lives. Furthermore, one must examine the community to understand DV and family-level functioning. These are the goals of the current study.

Impact of Community Violence on Children's Mental Health

Although there is little research on the influence of community violence on infants' mental health, research on the consequences of community violence for preschool and school-aged children suggests that living in a threatening neighborhood adversely affects children's socio-emotional functioning. For example, community violence exposure increases the likelihood of internalizing behavior problems in children. Data collected from 6- to 10-year-old children living in a moderately violent Washington D.C. neighborhood, according to D.C. police data on reported violent crimes (i.e. neighborhood level of reported violent crimes was just below median level of reported violence across all 7 multicensus track geographical areas of Washington D.C.), indicate that witnessing acts of community violence increases distress symptoms among children, which often result in depression and anxiety (Martinez & Richters, 1993). Similar to the majority of research on children and community violence, the researchers determined the frequency of community violence exposure based on child responses to the *Survey of*

Exposure to Community Violence (SECV) (Richters & Saltzman, 1990) and the *Things I have Seen and Heard* structured interview (Richters & Martinez, 1990), both of which assess witnessing and victimization of violent events, such as shootings, stabbings, arrests, domestic abuse, and physical threats, etc. Likewise, based on findings from their longitudinal study, Lynch and Cicchetti (1998) conclude that community violence exposure, as measured by the child-version of the *SECV* (Richters & Saltzman, 1990), places school-age children at risk for developing clinical levels of depression and anxiety.

While children exposed to violence often exhibit general symptoms of anxiety (Lynch & Cicchetti, 1998), several studies indicate that both acute and chronic community violence often result specifically in trauma symptoms in preschool- and school-age children (La Greca, Glickman, Perez, & Silverman, 2002; Lynch & Cicchetti, 1998; Nader, Pynoos, Fairbanks, & Frederick, 1990; Nader, Pynoos, Fairbanks, Al Ajeel, & al., 1993; Pynoos et al., 1987). For example, Pynoos et al. (1987) found that school-age children (ages 5-13) exhibited post-traumatic stress reactions in response to a deadly sniper attack on an elementary school playground in Los Angeles. Furthermore, the number of post-traumatic stress symptoms children displayed increased as the degree of exposure to the violent event increased (i.e., children on the playground at the time of the sniper attack exhibited more trauma symptoms than children who were in the school at the time of the event). Physical proximity to the attack remained the main predictor of post-traumatic stress reactions in a 14-month follow-up study (Nader et al., 1990). Likewise, studies suggest that school-age children exhibit posttraumatic stress symptoms following exposure to persistent violence, such as wartime violence (Nader et al., 1993)

and chronic community violence, based on child report of witnessing and victimization of violent crimes (La Greca et al., 2002; Lynch & Cicchetti, 1998).

In addition to displaying internalizing symptoms, children exposed to community violence often exhibit externalizing symptoms. Several researchers have found an association between community violence exposure and externalizing behavior problems in school-age children (Glickman, La Greca, & Perez, 2002; Gorman Smith & Tolan, 1998; Miller, Wasserman, Neugebauer, Gorman Smith, & Kamboukos, 1999). For example, Miller et al. (1999) found that 6 to 10-year-old boys' reports of witnessing extra-familial violence as measured by the *Conflict Tactics Scales* (Straus, 1979) were positively related to current antisocial behavior and antisocial behavior over time. Glickman et al. (2002) also found that community violence as measured by the *SECV* (Richters & Saltzman, 1990) was a significant predictor of externalizing behavior problems in 3rd-5th grade boys and girls. In the long run, growing up in violent communities places adolescent children at greater risk of adopting lifestyles and behavior patterns that make them susceptible to becoming violent perpetrators themselves (Dahlberg, 1998).

Similar to the literature concerning the impact of DV on children, exposure to community violence can result in internalizing and externalizing behavior problems, and PTSD in preschool- and school-aged children (Martinez & Richters, 1993; Miller et al., 1999; Pynoos et al., 1987). Yet, community violence and its implications for infants' mental health are not well studied, primarily because of the erroneous assumption that infants and toddlers are too young to be affected by such events (Osofsky, 1995). While young children's limited cognitive development may protect them from having a

complete understanding of violent events, Drell, Siegle, and Gaensbauer (1993) argue that even from the first few months of life, infants are capable of remembering events, including traumatic ones. In support of this assertion, clinicians and researchers suggest that community violence is associated with posttraumatic stress symptoms in infants (Osofsky, 1995; Osofsky & Fenichel, 1994; Zeanah, 1994). Furthermore, suggested secondary reactions to community violence may include fear, irritability, sleep disturbances, affect regulation, and the disruption of developmental tasks such as the development of trust and language (Osofsky, 1995; Osofsky & Fenichel, 1994; Pynoos, 1993; Zeanah, 1994).

Although these primary and secondary effects of exposure to traumatic events such as community violence have been observed in infants and toddlers, the relationship between community violence and infants' psychological adjustment has not been empirically supported. The present study addresses this gap in the literature, testing a model that includes a direct effect between community violence and infant functioning (see Figure 1).

Impact of Community Violence on Family Violence

In addition to affecting individual functioning, community violence may influence *microsystem* functioning. Violent communities may lead to increased violence within the family. Several researchers have reported a significant relationship between community violence exposure based on the *SECV* (Richters & Saltzman, 1990) and intrafamilial violence (Lynch & Cicchetti, 1998; Osofsky, Wewers, Hann, & Fick, 1993; Richters & Martinez, 1993). Richters and Martinez (1993) found a significant number of children who reported witnessing acts of community violence in Washington D.C. also reported

high levels of interparental violence as measured by the *Conflict Tactics Scale* (Straus, 1979). Osofsky et al. (1993) and Margolin and Gordis (2000) also report high rates of co-occurrence between exposure to community violence and spousal conflict. According to Sampson (1986), the likelihood of being victimized is two to three times higher among residents living in neighborhoods with high levels of family disruption, suggesting a positive association between community and family violence. Furthermore, results based on a study attempting to integrate the study of family violence and the study of criminal violence suggest that the severity of DV is associated with violence outside the home (Fagan, Stewart, & Hansen, 1983). Based on police data, Fagan et al. found that 46% of batterers had been previously arrested for other violent crimes, and that the most violent batterers were those who were violent toward strangers. Thus, there appears to be an overlap between DV and community violence. Community violence then, may be an enduring vulnerability factor for the occurrence of violence within the family. However, Fagan (1988) indicates that researchers still know little about the intersection of family and community violence; the suggested association between community violence and DV specifically, has minimal direct empirical support. The present study attempts to clarify the relationship between violence in the community and the likelihood of being a battered woman by including a path between community violence and DV in the hypothesized model (see Figure 1).

While little is known about the impact of community violence on DV, two studies suggest a link between community violence and child maltreatment. To test their assertion that community violence contributes to the proliferation of child maltreatment within the family, Lynch and Cicchetti (1998) conducted a one-year longitudinal study

examining 7- to 12-year-old children's history of maltreatment and exposure to community violence based on responses to the child version of the *SECV* (Richters & Saltzman, 1990). Using multiple-informant data based on 322 economically disadvantaged children, the researchers found independent effects of maltreatment and community violence on children's social and emotional adjustment, and that community violence predicted rates and severity of maltreatment. Thus, pervasive community violence can act as a potentiating factor for the occurrence and degree of child abuse at the family level. In addition, children's competence at Time 1 predicted their exposure to community violence at Time 2, suggesting that community and family factors transact to predict children's individual functioning. The researchers also report that maltreated children from violent neighborhoods exhibit consistently poorer functioning. These children show more externalizing and internalizing behavior problems, higher levels of traumatic stress and depression, and lower feelings of self worth as compared to nonabused children. Therefore, community violence and child maltreatment are risk factors for children's development and adaptation.

Coulton, Korbin, Su, and Chow's (1995) cross-sectional study of 177 residential census tracts in Cleveland, Ohio provides additional support for the claim that analyzing the community context is important to understanding child maltreatment rates. Although causal inferences cannot be drawn, the researchers found strong correlations between child maltreatment and other forms of deviant behavior. Using official child maltreatment data based on reports made to the County Department of Human Services, the researchers found a correlation of .63 between neighborhood violent crime (according to FBI index crimes against persons) and child maltreatment, a correlation of .42 between

drug trafficking (according to police drug arrests) and child maltreatment, and a correlation of .43 between juvenile delinquency (according to juvenile filings made at the County Juvenile Court) and child maltreatment. These results suggest a strong link between child maltreatment rates and neighborhood violence.

Although a few studies suggest a direct relationship between community violence and both interspousal conflict and child maltreatment, researchers have not yet explored the association between community violence and DV in detail. The present study will explicate the relationship between violence occurring in the community and within the family by examining the impact of community violence on DV specifically. Furthermore, given that DV has been shown to negatively affect children's socio-emotional functioning, DV will be also be tested as a mediator of the hypothesized relationship between community violence and infant mental health.

Impact of Violence on Maternal Psychological Functioning

Community violence may influence maternal psychological functioning, another *microsystem* variable, in addition to DV. At this time, little is known about the impact of community violence on women's mental health. In their literature review of children's reactions to family and community violence, Margolin and Gordis (2000) suggest that women may react similarly to children living in violent neighborhoods, experiencing feelings of helplessness, fear, and grief due to the safety and survival threats that community violence poses. One study supports this proposition. Based on the responses of 104 low-income mothers to a semi-structured interview assessing victimization and witnessing of community crime, Holland (1997) found that both direct exposure to

community violence and fear of victimization were associated with high levels of maternal depression.

While only one known study to date has documented the negative influence of community violence on maternal psychological functioning, research on domestic violence and its consequences for women's mental health may provide some clues. Battered women have been subjected to a type of violence exposure, and therefore, can help researchers to understand mental health outcomes for women exposed to community violence.

In an early attempt to study the effects of DV on maternal health, Hilberman and Munson (1977) interviewed all of the women referred by a rural health clinic for psychiatric evaluation during a 12-month period. Half of the 120 women needing mental health services were victims of marital violence, suggesting that women's psychological functioning is affected by DV. Case studies revealed that these battered women suffered from a variety of complaints, including somatic problems, low self-esteem, anxiety, depression, lack of energy, fatigue, insomnia, nightmares, paralyzing terror, fear, guilt, shame, and hopelessness. The women also reported feeling incompetent, unworthy, and unlovable. Finally, many of the women demonstrated suicidal behavior, especially by drug overdose (Hilberman & Munson, 1977).

Research findings corroborate these clinical reports. As compared to non-battered women, battered women experience increased levels of psychological distress (Thompson et al., 2000), depression (Cascardi, Langhinrichsen, & Vivian, 1992; Cascardi & O'Leary, 1992; Christopoulos et al., 1987; Kemp, Rawlings, & Green, 1991; Mitchell & Hodson, 1983; Moore et al., 1989; Wolfe et al., 1986), anxiety (Kemp et al., 1991;

Moore et al., 1989; Wolfe et al., 1986), and post-traumatic stress disorder (Houskamp & Foy, 1991; Kemp, Green, Hovanitz, & Rawlings, 1995; Kemp et al., 1991), in addition to lowered self-esteem (Dutton & Painter, 1993; Kemp et al., 1991; Mitchell & Hodson, 1983) and general feelings of hopelessness, fear, social isolation, and distrust (Kemp et al., 1991). For example, one study found that over half of a sample of severely battered women (i.e., 75% reported having been beaten up by their partners within the past year with 25% being beaten up more than 20 times in the past year, 84% sustained at least superficial wounds within the past year, and 31% required surgery or suffered a concussion as a result of their injuries) scored in the severe clinical range for depression (Cascardi & O'Leary, 1992). In addition, the degree of psychological disturbance seems to be related to frequency and severity of abuse. Based on the reports of 60 women who sought assistance at a domestic violence shelter, Mitchell and Hodson (1983) found that maternal stress (as indicated by frequency and severity of DV) is related to depression; women exposed to a greater frequency and severity of violence suffer from more severe depression than those exposed to less frequent and severe forms of violence. Likewise, Cascardi and O'Leary (1992) found self-esteem to be highly correlated with frequency and severity of abuse, such that as the level of battering increased, self-esteem decreased.

The psychological reactions of battered women are similar to trauma victims. One study found that battered women suffer from high rates of trauma symptoms, including dissociation, heightened anxiety and depression, and sleep disturbance (Dutton & Painter, 1993). Although not all battered women meet the criteria for PTSD, the prevalence of PTSD is high among battered women. In one study, 81% of physically battered women and 63% of verbally abused women suffered from PTSD (Kemp et al.,

1995). Although the group of verbally abused women were all currently in a relationship in which there was only verbal abuse, 96% of the verbally abused women reported physical abuse as a child, 31% reported sexual abuse by a family member as a child, 21% reported rape as an adult, and 15% reported a physically abusive relationship prior to the current psychologically abusive relationship (Kemp et al., 1995). Thus, it is possible that the trauma symptoms these women reported resulted from prior sexual or physical abuse and not solely from the verbal abuse they experienced. Another study found that 45% of a shelter sample of battered women met PTSD criteria (Houskamp & Foy, 1991). However, this estimate may be low as 34% of the women experienced only mild forms of DV. When the sample was divided into high and low exposure groups on the basis of the degree of perceived life-threat in the violent relationship, the results are more consistent with other studies; 60% of the women in the high exposure group met the full criteria for PTSD versus only 14% in the low exposure group (Houskamp & Foy, 1991). Thus, the risk of PTSD among battered women appears to be related to the severity and frequency of abuse. Battered women suffering from PTSD report higher levels of physical and verbal abuse, injury, forced sex, and perceived threat than battered women who do not meet the criteria for PTSD (Kemp et al., 1995).

Although research on community violence and its consequences for women's mental health is virtually nonexistent, studies indicate that battered women suffer from a myriad of mental health problems (Kemp et al., 1991; Wolfe et al., 1986). Given this body of literature, it is possible that other forms of violence, such as community violence may negatively impact maternal psychological functioning in ways similar to that of DV. The present investigation examines this relationship by incorporating a path between

community violence and maternal psychological functioning in the hypothesized model (see Figure 1). Furthermore, given the research suggesting that poor maternal psychological functioning, in the context of DV, may negatively affect children's mental health (Levendosky et al., 2000), the current study will examine the role of maternal psychological health as potentially mediating the impact of community violence on infants' socio-emotional development.

Hypotheses and Rationale

Because environmental contexts and individual functioning transact and mutually influence each other, a thorough assessment of each ecological level is necessary in the conceptualization of DV. Most existing relevant research, however, has focused only on factors within the *ontogenic* and *microsystem* levels that affect individuals' competence and adaptation, while ignoring both *exosytem* and *macrosystem* factors. Few researchers have taken a contextual approach to studying DV.

Infants live within many systems. Thus, to gain a broad understanding of DV, including risk factors and poor developmental outcomes, we must examine all of the systems within which an infant lives. This study will expand the DV literature by integrating an ecological/transactional framework and systems theory in proposing a mediator model of DV, which considers one *exosystem* variable, community violence, and two *microsystem* variables, DV and maternal psychological functioning, as risk factors for infants' social and emotional competence (see Figure 2 for hypothesized measurement model). According to systems theory, examination of the community context will lead to a more comprehensive understanding of the effects that DV has on infants.

Thus far, researchers have provided evidence linking DV and a range of emotional and behavioral problems in preschool and school-age children, including anxiety, depression, aggressiveness, delinquency (Fantuzzo et al., 1991; Graham Bermann, 1996; Jaffe et al., 1986; Mathias et al., 1995; Moore et al., 1989; Rosenbaum & O'Leary, 1981; Sternberg et al., 1997; Straus et al., 1980; Wolfe et al., 1985), PTSD (Graham Bermann & Levendosky, 1998; Lehmann, 1997; Levendosky et al., 2002), and

diminished social competence (Mathias et al., 1995; Moore et al., 1989; Wolfe et al., 1985; Wolfe et al., 1986). However, infants remain an understudied population in the context of DV, even though young children are at a disproportionately high risk for exposure to DV (Fantuzzo et al., 1997; Straus et al., 1980), and evidence suggests that infants are capable of sensing interparental violence (Walker Andrews, 1997) and potentially affected as a result (Alessi & Hearn, 1984; Cummings et al., 1981; Easterbrooks et al., 1994; Layzer et al., 1986). In addition to the omission of infants in DV analyses, *exosystem* variables have not been explored. Research on community violence suggests that neighborhood violence may have negative consequences for preschool and school-age children's behavioral (Glickman et al., 2002; Gorman Smith & Tolan, 1998; Gorman-Smith & Tolan, 1998; Miller et al., 1999), and emotional (La Greca et al., 2002; Lynch & Cicchetti, 1998; Nader et al., 1990; Pynoos et al., 1987) development. However, there is no known research examining the impact of community violence on infants' adjustment in the context of DV. The present investigation is the first known study to address these gaps in the research literature, hypothesizing that proximity to community violence, based on police incidents of violent crime in the community, will increase infants' social and emotional behavior problems as measured by maternal report of activity level, aggression, peer aggression, negative emotionality, and depression/withdrawal.

According to systems theorists, individual adaptation can only be understood after considering all of the ecological levels within which an individual lives and the transactions that occur among them (Wagner & Reiss, 1995). Therefore, considering the community and its influence on the individual without accounting for a family influence

would be erroneous. In addition to affecting individual functioning, research suggests that community violence may influence *microsystem* functioning. For example, evidence suggests that community violence may set the stage for the occurrence of violence within the family. Several researchers have found a significant, positive relationship between community and family violence, reporting high levels of co-occurrence between neighborhood violence and intrafamily conflict, including spousal violence (Lynch & Cicchetti, 1998; Margolin & Gordis, 2000; Osofsky et al., 1993; Richters & Martinez, 1993; Sampson, 1986). However, the association between community violence and DV specifically, has no direct empirical support. In contrast, research on child maltreatment, another form of family violence, has begun to include community violence as a risk factor. For example, Lynch and Cicchetti (1998) conducted a longitudinal study on 322 children, finding that community violence predicted rates and severity of child maltreatment, suggesting that community violence may lead to violence within the family. Thus, it is possible that community violence acts as a potentiating factor for the occurrence of DV. Given that community violence may be a risk factor for DV, and that DV is a risk factor for children's adjustment (Mathias et al., 1995), it is possible that an understanding of the impact of community violence on infants is more comprehensive when considering its impact through DV. Thus, the second hypothesis of the proposed study is that DV mediates the relationship between community violence infants' social and emotional competence (see Figure 2).

Community violence may also influence maternal psychological functioning, another *microsystem* variable in addition to impacting DV. Research suggests that the presence of a supportive relationship with a parent is a protective factor for children

exposed to DV (Kaufman & Zigler, 1987). However, exposure to high levels of community violence may compromise women's health, thereby limiting their ability to be effective caregivers. Little research has been conducted concerning the effects of community violence on maternal psychological functioning. However, one study suggests that community violence is associated with high levels of depression in mothers (Holland, 1997). And studies indicate that poor mental health limits mothers' ability to parent effectively (Crnic et al., 1984; Levendosky et al., 2000). Furthermore, children exposed to DV appear to be the most troubled when their mothers are in emotional distress (Pepler & Moore, 1995; Wolfe et al., 1985). Thus, poor maternal health, in the context of DV, can have negative consequences for children's adjustment.

The negative impact of DV on children's well-being has been shown to be partially mediated by maternal psychological functioning (Levendosky et al., 2000), but no known study has considered maternal mental health as a mediator between community violence and infant adjustment. Since aspects of the *exosystem* can create increased risk for problems in other ecological systems, it is necessary to examine community-level variables in addition to family-level (*microsystem*) and individual-level (*ontogenic*) variables. Thus, in keeping with an ecological framework, the present study examines the possibility of an additional indirect effect, hypothesizing that maternal psychological functioning, as measured by maternal report of depression, anxiety, and PTSD, mediates the relationship between community violence and infant adjustment (see Figure 2).

Approximately 10 million children witness intimate partner violence against their mothers every year in the United States (Straus, 1991). With the large number of children exposed to DV within the home, it is important to examine all of the systems in

which a child lives and the possible risk and protective factors each level of ecology may contain. The present study is an initial attempt to expand the focus of DV researchers and add to the literature by exploring the community, an *exosystem* variable, and its impact on the social and emotional competence of infants, an understudied population. In addition to determining whether community violence is associated with greater maladaptation in infants' development, the results of this study will contribute to interventions designed to reduce and/or eliminate the negative outcomes DV exposure appears to have on children. Pepler et al. (2000) suggest taking a systemic perspective on interventions for children exposed to DV. In order to develop interventions that encompass all of the systems in which a child lives, however, we must first begin to examine the broad ecological forces that affect children exposed to DV. The proposed study is the first known effort to understand how the community context influences infants' experiences of DV, and the results should provide more avenues for intervention programs by suggesting interventions at both the community and family levels.

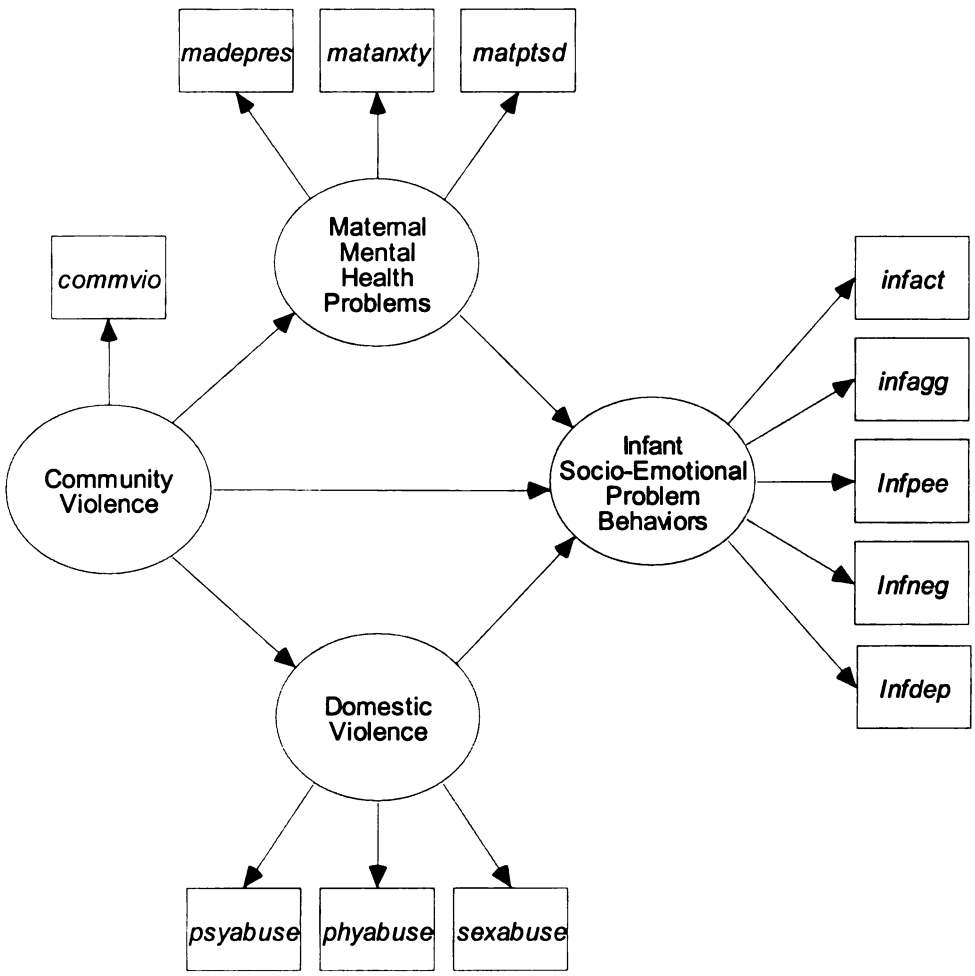

Figure 2. Hypothesized measurement model.[1]

[1] See p. v for key to model variable names

Method

Research Participants

The proposed study was performed in conjunction with a larger study at Michigan State University conducted by Alytia Levendosky, G. Anne Bogat, William Davidson, and Alexander von Eye. Participants included 94 mother-infant dyads selected from the 206 women who are participants in the Mother-Infant Study, a longitudinal investigation regarding the impact of domestic violence on women and children. Women initially enrolled in the study during the last trimester of pregnancy and are currently being followed through their infants' second year of life. Participants were recruited from the Clinton, Eaton, and Ingham counties of Mid-Michigan by posting flyers (see Appendix A) at multiple sites, including Obstetric/Gynecological clinics and other women's health clinics, domestic violence shelters, legal agencies, and several social service programs, such as FIA, WIC, Head Start, Jump Start, and Maternal Infant Outreach Program. In addition, flyers were posted in the community at libraries, laundromats, stores, and other public areas.

Women interested in participating contacted the project office, at which time a trained research assistant conducted a brief screening to determine eligibility. Women were required to be between 18 and 40 years of age, in their third trimester of pregnancy at the time of their initial interview, and involved in a romantic relationship that lasted for at least 6 weeks sometime during their pregnancy. Women were excluded from participation in the study if it was believed that they would have difficulty understanding questionnaires due to a limited knowledge of the English language.

After approximately half of the sample had been enrolled in the study (n=96), additional screening procedures were instituted to ensure that a reasonable number of subjects experienced DV during pregnancy. During the telephone screen, the Conflict Tactics Scale (Straus, 1979) was administered in order to track the number of battered and non-battered women. For the purpose of recruitment, women were categorized as "battered" if they experienced physical violence during pregnancy according to this measure. This screen was used to exclude women who had not experienced DV during pregnancy once it was determined that enough non-battered women were already enrolled. After 137 women had been recruited and interviewed, it was discovered that many of the "non-battered" women had experienced DV in a prior relationship. Thus, the telephone screen was then also used to enroll women who had never experienced DV, in addition to those who experienced DV during their current pregnancy. Overall, 161 women who called the project office to participate were deemed ineligible because they did not meet age, language, relationship status, or battering experience criteria. There are no significant demographic differences between these excluded women and participants.

Although 206 women met the inclusion criteria and voluntarily agreed to participate in the first wave of data collection, attrition due to moving and loss of contact resulted in 190 subjects having completed data at the time of their infants' first birthday. The 94 mother-infant dyads selected for the project from the total sample of 190 having completed data are those who resided in the Lansing metropolitan area at the time of the infants' first birthday. Currently, data on community violence is only available for those women and children living in the Lansing area.

Approximately half of the 94 women in the study identify themselves as Caucasian/White (45.7%), with 38.3% identifying themselves as Black/African American, 8.5% Latina/Hispanic/Chicana, 5.3% Biracial, 1.1% Native American, and 1.1% Other (see Table 1). Women identify their infants as 37.2 % Black/African American, 31.9 % Biracial, 25.5% Caucasian/White, 3.2% Latino/Hispanic/Chicano, 1.1% Asian American/Pacific, and 1.1% Native American (see Table 2). The average age of women in the study is 26.15 years, while the average age of the infants is 1.10 years. The majority of women have a high school diploma, equivalent, or some high school education (44.7%); 34.0% have some college; 6.5% have completed trade school; and 3.2% have earned an associate's degree, 7.4% a bachelor's degree, and 4.3% a graduate degree. Monthly income for the women ranges from $267 to $7,000, with a median monthly income of $1,350. Over half of the women in the present study are single/never married (52.1%), 35.1% are married, and 12.8% are separated, divorced, or widowed. On average, the women have 2.10 biological children.

Table 1

Demographic Information on Mothers

Characteristic	N=94
Racial/Ethnic Group	
Caucasian/White	43 (45.7 %)
African American/Black	36 (38.3 %)
Latino/Hispanic/Chicano	8 (8.5 %)
Biracial	5 (5.3 %)
Native American	1 (1.1 %)
Other	1 (1.1 %)
Educational Status	
Grades 1 – 13	42 (44.7 %)
Some College/ Trade School/ or A.A. Degree	41 (43.6 %)
B.A./B.S. or Graduate Degree	11 (11.7 %)
Marital Status	
Single/Never Married	49 (52.1 %)
Married	33 (35.1 %)
Separated/ Divorced/ or Widowed	12 (12.8 %)
Median Family Income	$1350
	(SD = $1444)
Mean Age	26.15
	(SD = 5.03)
Mean Number of Biological Children	2.10
	(SD = 1.32)

Table 2

Demographic Information on Infants

Characteristic	N=94
Racial/Ethnic Group	
African American/Black	35 (37.2 %)
Biracial	30 (31.9 %)
Caucasian/White	24 (25.5 %)
Latino/Hispanic/Chicano	3 (3.2 %)
Asian American/Pacific	1 (1.1 %)
Native American	1 (1.1 %)
Gender	
Female	48 (51.1 %)
Male	46 (48.9 %)
Mean Age	1.10
	(SD = .15)

Measures

Demographic information was gathered at Time 1 (T1), during women's third trimester of pregnancy, at Time 2 (T2), when the infant was 2 months of age, and at Time 3 (T3), when the infant was 12 months of age. Data collection for DV, as well as for mother and child outcomes occurred at T3. Community violence data occurring a year prior to T3 was collected retrospectively.

Demographics

Brief questionnaires were administered at T1, T2, and T3 to obtain basic information from participants, such as ethnicity, family composition, marital or relationship status, parental education level, parental occupation, and family income (see Appendix B).

Infant and Maternal Mental Health

Infant social and emotional functioning. Infant social and emotional adjustment was assessed using the Infant Toddler Social and Emotional Assessment (ITSEA), a 107-item, parent-report questionnaire designed to measure multiple dimensions of social-emotional problems and competencies in 12- to 24- month-old children (Briggs-Gowan & Carter, 1998). The ITSEA is a comprehensive measure, which can be used to evaluate four problem domains: externalizing, internalizing, dysregulation, and maladaptive behaviors. Of the sixteen problem and competence scales included in the ITSEA to cover the four domains, five scales were chosen for the proposed study: activity level, aggression/defiance, peer aggression, emotional negativity, and depression/social withdrawal. At T3, each participant was given a list of 42 behaviors and asked to rate how true each behavior was of her child (see Appendix C). Examples of behaviors

include, "Is restless and can't sit still," "Hits, kicks, or bites children or adults," "Hurts other children on purpose," "Is impatient or easily frustrated," and "Avoids physical contact." Responses were rated on a three-point scale from "Not true/rarely" to "Very true/often." A "No opportunity" code was also provided so mothers could indicate that they have not had the opportunity to observe certain behaviors. Participants received a mean score for each of the five scales. Scale scores will be calculated by summing the items in each scale and dividing by the total number of non-missing items for a given subject. Scale scores will range from 0 to 2, with a 0 indicating that almost all items were rated as "Not True/Rarely," while a score closer to 2 indicating that the majority of the items were rated as "Very True/Often."

Preliminary findings from an ethically and educationally diverse sample of 219 parents and their 12- to 36-month-old children indicate that the ITSEA is an acceptable measure of infant social and emotional adjustment with high test-retest reliability, validity, and internal consistency (Briggs-Gowan & Carter, 1998). Intraclass correlation coefficients for the five scales selected for the present study ranged from .70 to .87 (Briggs-Gowan & Carter, 1998), indicating that the measure is reliable across time. The criterion validity of the ITSEA was established by observing high correlations between the ITSEA and other measures of child temperament and behavior (Briggs-Gowan & Carter, 1998), including the Child Behavior Checklist (Achenbach, Edelbrock, & Howell, 1987), the Colorado Child Temperament Inventory (Rowe & Plomin, 1977), and the Parenting Stress Index (Abidin, 1990). Finally, the measure was observed to be internally consistent with coefficient alphas for the five scales ranging from .69 for the depression/social withdrawal subscale to .86 for the peer aggression subscale (Briggs-

Gowan & Carter, 1998). In the present study, coefficient alphas on the five selected subscales range from .65 for the depression/social withdrawal subscale to .87 for the aggression subscale.

Maternal posttraumatic stress. Maternal posttraumatic stress was assessed using the Posttraumatic Stress Scale for Family Violence, a 17-item questionnaire developed to assess the psychological trauma of battered women (Saunders, 1994). Based on the DSM III-R criteria for Posttraumatic Stress Syndrome, the measure includes three subscales: 1) avoidance of stimuli, 2) intrusive reexperiencing and 3) increased arousal. At T3, participants were asked to rate the number of times they experienced each item as a result of psychological and/or physical abuse (see Appendix D). Example items include, "Trying to avoid thought or feelings associated with the behaviors," "Unpleasant memories of the behaviors you can't keep out of your mind," "Much less interest in important activities since the behaviors," and "Very easily startled." Responses are rated on an 8-point scale ranging from "never" to "over 100." A total posttraumatic stress score was calculated by summing the answers on all 17 items. Possible scores range from 0 to 119.

Saunders (1994) has demonstrated concurrent validity for the Posttraumatic Stress Scale for Family Violence by finding significant, positive correlations with the subscales of the Impact of Event Scale (Horowitz, Wilner, & Alvarez, 1979). Internal consistency for the scale has also been shown to be high; based on a sample of 192 battered women, Saunders reported an alpha of .94 for the entire scale and alphas ranging from .79 to .92 for the three subscales. In the present study, the coefficient alpha for the entire scale is .95.

Maternal anxiety. Maternal anxiety was assessed using the Brief Symptom Inventory (BSI), a brief psychological self-report symptom inventory (Derogatis & Melisaratos, 1983) that evolved from its parent instrument, the SCL-90-R. It consists of 53 items that measure nine primary symptom dimensions: somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism.

For the present study, only the anxiety dimension was administered (see Appendix E). At T3, participants were asked how much they were distressed by 6 specific symptoms during the previous week. Example items include, "Nervousness or shakiness inside," "Feeling fearful," and "Feeling so restless you can't sit still." Each item is rated on a 5-point scale of distress, ranging from "not at all" to "extremely." A total anxiety score was obtained by summing the answers on all 6 items. Possible scores range from 0 to 24.

The anxiety dimension of the BSI is both reliable and valid. Test-retest reliability of 60 non-patient participants revealed a coefficient of .79 (Derogatis & Melisaratos, 1983), indicating that the BSI-A is a stable measure over time. The correlation between the anxiety dimensions of the BSI and SCL-90-R is .95 (Derogatis & Melisaratos, 1983), suggesting that the BSI has good alternate forms reliability. In addition, the dimensions of the BSI and the scales of the MMPI are highly convergent (Derogatis & Melisaratos, 1983). Finally, the anxiety dimension of the BSI is internally consistent. Based on a sample of 1002 outpatients, Derogatis and Melisaratos (1983) report a Cronbach's alpha of .81. In the present study, the coefficient alpha for the anxiety dimension is .73.

Maternal depression. Maternal depression was measured at T3 using the Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), a 21-item self-report questionnaire developed to assess the intensity of depression (see Appendix F). The instrument covers a wide variety of symptoms of depression, including depressed mood, sense of failure, social withdrawal, self-loathing, and sleep and eating disturbances. Each of the 21 symptom categories consists of four evaluative statements that are ranked from neutral to severe with values of 0-3 assigned to each statement. For example, the first symptom category, depressed mood, consists of the following four statements: "I do not feel sad," "I feel sad," "I am sad all the time and I can't snap out of it," and "I am so sad or unhappy that I can't stand it." At T3, each participant was asked to choose the statement from each grouping that best described how she had been feeling during the course of the previous week. The total depression score was obtained by summing the answers of all 21 items. Possible scores range from 0-63, with scores of 0-9 indicating no depression, 10-15 indicating mild depression, 16-23 indicating moderate depression, and any score over 24 indicating severe depression.

The Beck Depression Inventory (BDI) was originally designed to measure the behavioral manifestations of depression in psychiatric populations. Beck et al. (1961) reported a split-half reliability of .93 after a Spearman-Brown correction. The researchers also examined the validity of the BDI by comparing scores on the inventory to psychiatric ratings of depression and found a significant correlation coefficient of .67. In the present study, the coefficient alpha is .86, suggesting that the BDI is also internally consistent.

Violence

Domestic Violence. The frequency and severity of domestic violence, defined as adult male violence against female partners was assessed using the Severity of Violence Against Women Scales (Marshall, 1992), a 46-item instrument, which considers the seriousness, abusiveness, aggressiveness, violence, and threat values of the behaviors, as well as the emotional impact the acts have on the recipients (see Appendix G). The Severity of Violence Against Women Scales (SVAWS) is composed of nine dimensions: symbolic violence; mild, moderate, and serious threats of physical violence; minor, mild, moderate, and serious actual physical violence; and sexual violence. At T3, each participant was requested to report how often her partner did each behavior to her during the last year. Example items include, "Hit or kicked a wall, door, or furniture," "Threatened to hurt you," "Pushed or shoved you," "Beat you up," and "Physically forced you to have sex." Women rated their experiences of abuse during their child's first year of life on a 4-point scale ranging from "Never" to "Many times." In the present study, the nine dimensions were collapsed to create three subscales: psychological abuse, physical abuse, and sexual abuse. The psychological abuse scale is composed of the symbolic violence and threats of physical violence dimensions (i.e., items 1-19). The physical violence scale is composed of the actual physical violence dimensions (i.e., items 20-40). Finally, the sexual abuse scale consists of the sexual violence dimension (i.e., items 41-46). Each scale was considered to be a continuous variable. A severity score was calculated for each scale by multiplying the number of times each item occurred by its physical harm impact weight and summing the weighted

items for each subscale across partners (in the present study, participants had 2 partners at most).

A study of a community sample of 208 women revealed that the SVAWS has high internal consistency (Marshall, 1992). Coefficient alphas for the nine subscales ranged from a low of .89 for symbolic violence to a high of .96 for both mild and serious physical violence (Marshall, 1992). In the present study, coefficient alphas range from .57 for the collapsed sexual abuse scale for partner 1 to .96 for the collapsed physical abuse scale for partner 2.

Community Violence. Community violence was measured using ArcView GIS 3.2, a Geographic Information Systems and spatial analysis desktop computer software program. First, police data were used to create an incidence map of community violence. Although police data do not necessarily capture an individual's experience of violence, police data are an indicator of the likelihood of exposure to community violence. In addition, they represent the only regular source of information on incidents of community crime that is readily available, timely, and includes incident location (Miles-Doan, 1998). Therefore, all incidences of violent crime that occurred in the Lansing metropolitan area between February 1999 and April 2000, to correspond to the year prior to T3 data collection, were digitally geocoded to create an incidence shapefile of community violence. Multiple types of crimes were considered "violent" for the purposes of this study, including criminal sexual conduct; robbery; assault; domestic abuse; child abuse, and torture; murder; manslaughter; homicide; kidnapping; ethnic intimidation; stalking; and weapons offenses (See Table 3 for Incident Type and Frequency).

After creating the incidence base, all participant addresses at the time of their T3 interview date were geocoded. A shapefile of each participant address was then created and spatially joined with the violent crimes incidence shapefile to create a new shapefile containing all incidences of violent crime that occurred in Lansing during the specified dates, each participant's T3 address, and the distance between each incident of violent crime and each participant's address (see Figure 3 for Location of Study Participants and Violent Crimes). A proximity score was calculated for each mother-infant dyad by computing the average distance between each participant's T3 address and each incident of violent crime to represent the amount of community violence each mother-infant dyad experiences. Proximity scores were reverse coded, such that larger distances represent more community violence exposure and smaller distances represent less community violence exposure.

Table 3

Incident Type and Frequency

Incident Type	Frequency (N=1005)
Assault	260
Child Abuse	0
Child Torture	0
Criminal Sexual Conduct	0
Domestic Abuse	656
Ethnic Intimidation	0
Homicide	0
Kidnapping	0
Manslaughter	0
Murder	0
Robbery	78
Stalking	0
Weapons Offenses	11

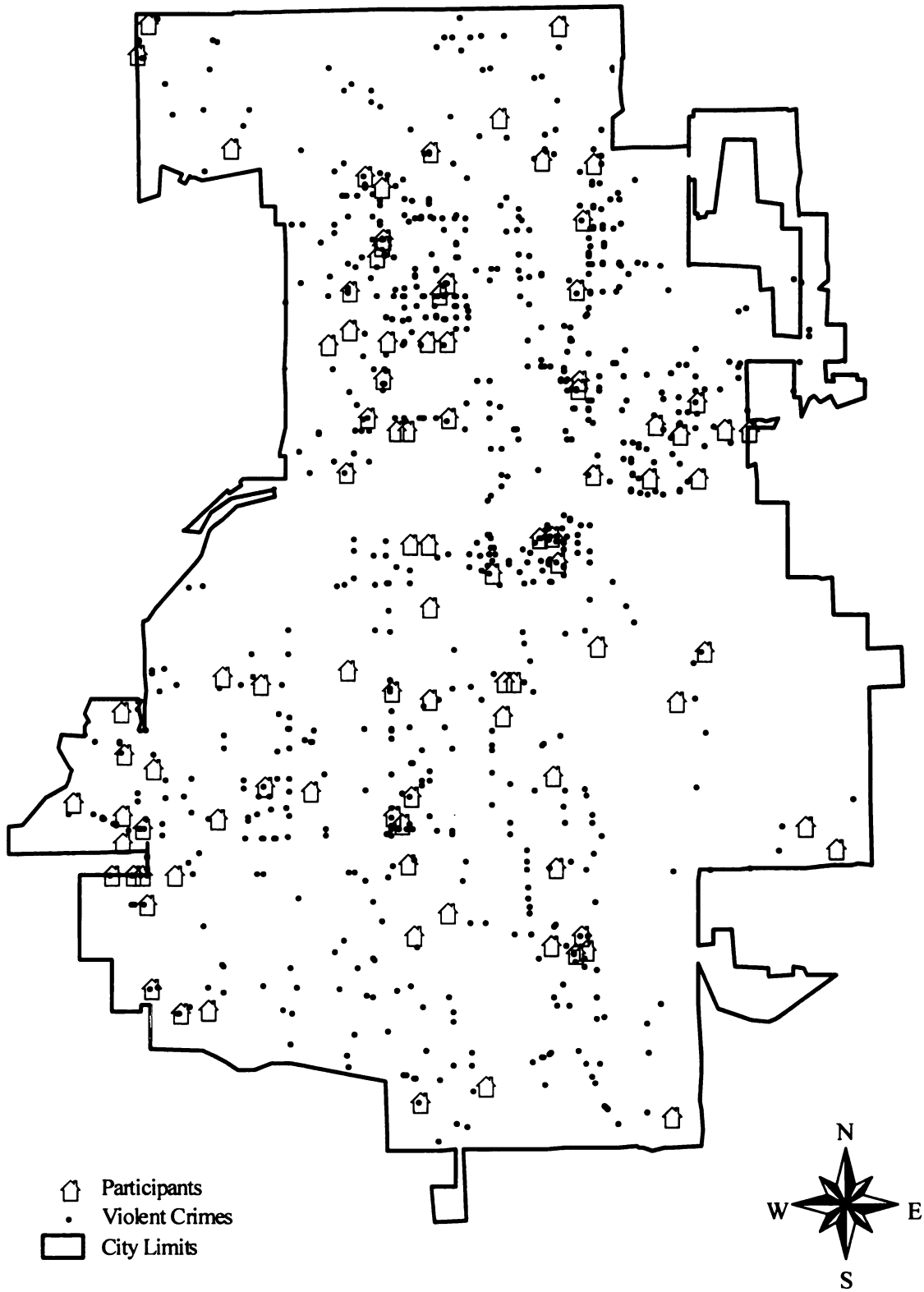

Figure 3. Location of study participants and violent crimes during 2/1999-4/2000.

Procedures

Recruitment

To ensure participation of a diverse sample of women, two different flyers were distributed to the recruitment sites. One flyer recruited pregnant women, in general, while the other recruited women who had been hurt (i.e. pushed, slapped, kicked, punched, or worse) by a romantic partner during pregnancy. Women interested in participating contacted the Mother-Infant Study office, at which time they were screened for eligibility, as determined by demographic information and the presence of a relationship during current pregnancy. The screening process consisted of a five-minute phone interview with a research assistant. If the woman met the specified participant criteria, an appointment was made and the first interview conducted. Confidentiality was maintained by assigning all participants an identification number, which was placed on all data as opposed to participant names, and participant names were kept in a separate tracking file.

T3 Interview

When participants' infants were approximately 11 months old, women were contacted by phone to schedule an interview. If participants were unable to be reached directly, efforts were made to contact them through several recontact people whose names, addresses, and telephone numbers were provided by participants during their first interview. Research assistants went to those participants' and recontact people's homes if all other methods of tracking failed. A letter confirming the scheduled appointment was sent to all women interested in completing the interview, along with a packet of questionnaires, including the ITSEA, which was to be completed prior to the

appointment. Women came with their infants to the project office at their scheduled time, at which time trained undergraduate and graduate research assistants explained the interview procedure, assured anonymity and confidentiality, and administered a consent form (see Appendix H) and questionnaires. Interviewers read all instructions and selected questionnaires aloud, as well as offering to administer the remaining questionnaires orally in the event that a participant was illiterate. All interviewers were blind to the battering status of each woman at the time of the interview; this was ensured by administering the questionnaires on DV at the end of the interview. Questionnaires required approximately 60 to 90 minutes to finish. Upon completion of the questionnaires and other tasks (for purposes of the larger study), women received $75.00 cash and a baby gift worth about $8.00 for their participation, a list of community resources detailing services in the area for mothers and infants, and a Mother-Infant Study business card with the project phone number. Women were encouraged to call the office if they had any questions or to update contact information.

Research Assistant Training

Training for tracking procedures and administration of the questionnaires was intensive. The mother interviewers were a group of seven ethnically diverse, female undergraduate and graduate-level students who either volunteered, or received college credit or an hourly wage for their participation. All interviewers underwent a 7-month training period, during which they learned the tracking procedures, gained familiarity with the questionnaires, and practiced administering the interview. Training consisted of mock interviews, role-plays, didactic instruments such as journal articles and discussions, and observation of real interviews conducted by experienced interviewers. In addition to

learning the logistics of tracking and questionnaire administration, the interviewers were trained to be empathic and remain neutral and non-judgmental during the course of the interviews. Finally, trainees conducted several interviews under supervision until they were deemed capable of conducting a solo interview. All interviewers continued to meet on a weekly basis throughout the data collection period to discuss any concerns or problems they encountered during interviews, and to receive qualitative feedback from experienced interviewers.

Community Violence Data

Several steps were undertaken to obtain community violence data. First, Lansing jurisdiction and street shapefiles as well as a shapefile containing all incidences of crime that occurred in the Lansing metropolitan area from 1991 through October 2001 were obtained from the School of Criminal Justice at Michigan State University. In order to protect the confidentiality of Lansing residents, names were excluded from the attributes table of the crime shapefile, and the last two digits of all address numbers corresponding to incident locations were removed following geocoding. Next, ArcInfo was used to project all data in the obtained shapefiles[2]. Following data projection, violent crime incidents that occurred between February 1999 and April 2000 to correspond to the year prior to T3 data collection were selected from the Lansing crime data file. These incidents constituted a new shapefile: Lansing violent crimes.

Because community violence information is currently only available for Lansing Metropolitan residents, the next step was to select only those participants living within Lansing city limits (n=94) from the 206 mother-infant dyads enrolled in the larger study.

Initially, participants were considered to be Lansing residents based on the address they provided at the time of the T3 interview. All participant addresses containing Lansing as the city were selected and a new file was created and prepared for geocoding (n=111). However, the initial digital geocoding of these participant addresses revealed that several women had Lansing city mailing addresses and yet, did not live in the Lansing Metropolitan area. Thus, participants whose addresses fell outside the Lansing city limits were dropped from the study (n=16).

In addition to those participant addresses that were not located within the Lansing Metropolitan area, several additional participant addresses would not digitally geocode. A comparison of the Lansing street shapefile, a paper map of Lansing, and MapQuest, revealed a variety of reasons contributing to the unmatched status of these participants, including data collection, entry, and spelling errors in both our participant address file and in the Lansing street shapefile. For example, *Martin Luther King Boulevard* was labeled as *King* in the Lansing street shapefile preventing all participants living on this road from being digitally geocoded. Therefore, all errors were corrected by editing these files.

Subsequently, participant addresses were digitally geocoded again using the revised files. Use of the revised files resulted in a match for all but one participant (n=94). Examination of this participant's address, the Lansing street shapefile, a paper map of Lansing, and MapQuest revealed that this participant did live within Lansing city limits. Thus, this participant address was manually geocoded (n=95). Next, match scores were examined for all digitally matched participants to check for the accuracy of the

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[2] The Michigan Georef Coordinate System was utilized as it is the standard map projection for Michigan data.

geocoding process.[3] One-hundred percent match scores were obtained for all but 6 participants, whose scores ranged from 67 to 78 (n=87). Examination of these 6 participant addresses revealed that 2 participants gave addresses with street directions that were missing from the Lansing street shapefile and 1 participant's reported street name *Howell* geocoded as *Howe.* The explanations for the lower sensitivity scores for the remaining 3 participants could not be determined. By comparing these participant addresses, the Lansing street shapefile, MapQuest and a paper map of Lansing, as well as by physically driving to participant homes, it was determined that 5 of these 6 participant addresses were correctly geocoded and thus, should be included in the study (n=94). The remaining participant with the street name *Howell* was dropped from the study as the street could not be located in Lansing and the participant could not be reached to verify that we had correctly entered the street name in our address file. After finalizing our Lansing participants and obtaining violent crime data for the city of Lansing, community violence scores were calculated using ArcView GIS 3.2.

[3] A match score is the score required to match a candidate generated by ArcView to the current address. The score can be set from 0-100.

Results

Missing Data

Due to loss of child custody, ITSEA data on all subscales were missing for one participant. In addition, several women reported that they did not have the opportunity to observe specific child behaviors outlined on the ITSEA, resulting in missing subscale data for several mother-infant dyads. One participant was missing data for the negative emotionality subscale, two participants were missing data for the aggression subscale, two participants were missing data for the depression subscale, and 8 participants were missing data for the peer aggression subscale.

Due to the large percentage (8.5%) of participants who were unable to report on items designed to measure peer aggression, the peer aggression subscale was dropped from the model. However, in order to maximize statistical power, all other missing data were estimated and imputed using the EM algorithm available in SYSTAT 10.0 software following all data recoding. Missing data points were estimated based on all variables included in the current study. Estimation was successful as evidenced by the similar descriptive data for measures before and after estimation (see Table 4). Thus, structural model testing was based on data from 94 participants.

Table 4

Descriptive Data for Measures in the Hypothesized Model (N=94)

Measure	Mean (after estimation)	SD (after estimation)	Range of Scores	Possible Range	Mean (before est.)	SD (before est.)
Community Violence:						
1. Total score	2619.32	1032.09	1.00-3940.67	0-14053.72	2619.32	1032.09
Maternal Mental Health:						
2. Depression	6.35	5.84	0-29	0-63	6.35	5.84
3. Anxiety	2.38	2.95	0-12	0-24	2.38	2.95
4. PTSD	4.94	12.16	0-57	0-119	4.94	12.16
ITSEA:						
5. Activity	.90	.42	0-2	0-2	.90	.42
6. Aggression	.64	.43	0-2	0-2	.64	.44
7. Peer Aggression	.33	.34	0-1.63	0-2	.32	.34
8. Neg. Emotionality	.41	.47	0-2	0-2	.41	.47
9. Depression	.05	.12	0-.78	0-2	.05	.12
SVAWS:						
10. Psychological Abuse	1.64	3.30	0-17.34	0-21.76	1.64	3.30
11. Physical Abuse	1.54	4.50	0-24.02	0-48.70	1.54	4.50
12. Sexual Abuse	.11	.54	0-4.45	0-13.53	.11	.54

Full Structural and Measurement Model

Model testing was guided by the theoretically-derived model shown in Figure 2. The model included 4 latent variables and 11 indicators. Community violence was defined as an exogenous variable, while remaining variables were specified as endogenous. Due to the unsatisfactory distributions of several variables (i.e., Maternal PTSD, Psychological Abuse, Physical Abuse, Sexual Abuse, ITSEA Depression) as evidenced by skewness and kurtosis values above 2 and 3, respectively, model testing was based on the polychoric matrix of the indicators, using Lisrel 8.52 software (see Appendix I for the correlation matrix of model variables). The psi matrix (factor residuals), and the theta-delta and theta-epsilon matrices (indicator residuals) were specified as symmetrical and fixed. The gamma and beta matrices were specified as full and fixed. Residual variances of the factors and indicators were estimated, assuming that both latent and manifest variables had some measurement error.

A good fit was determined by several overall fit indices: a non-significant chi-square value, a Root Mean Square Error of Approximation (RMSEA) value of less than .05, and Goodness of Fit and Nonnormed Fit Indices (GFI and NNFI , respectively) above the standard "critical value" of .90 (Raykov, Tomer, & Nesselroade, 1991).

The method of estimation used was Maximum Likelihood (ML). ML is the recommended method of estimation as it performs well under less than favorable analytic conditions (e.g., excessive kurtosis), yielding optimal parameter estimates (Hoyle & Panter, 1995). Results based on the initial model revealed that the model poorly fit the data (See Figure 4 for standardized path coefficients and p-values). The χ^2 value was

127.33, df=40,p=0.00, the RMSEA was .15, the GFI was .80, and the NNFI was .86. Thus, the overall fit indices indicated significant problems with the model.

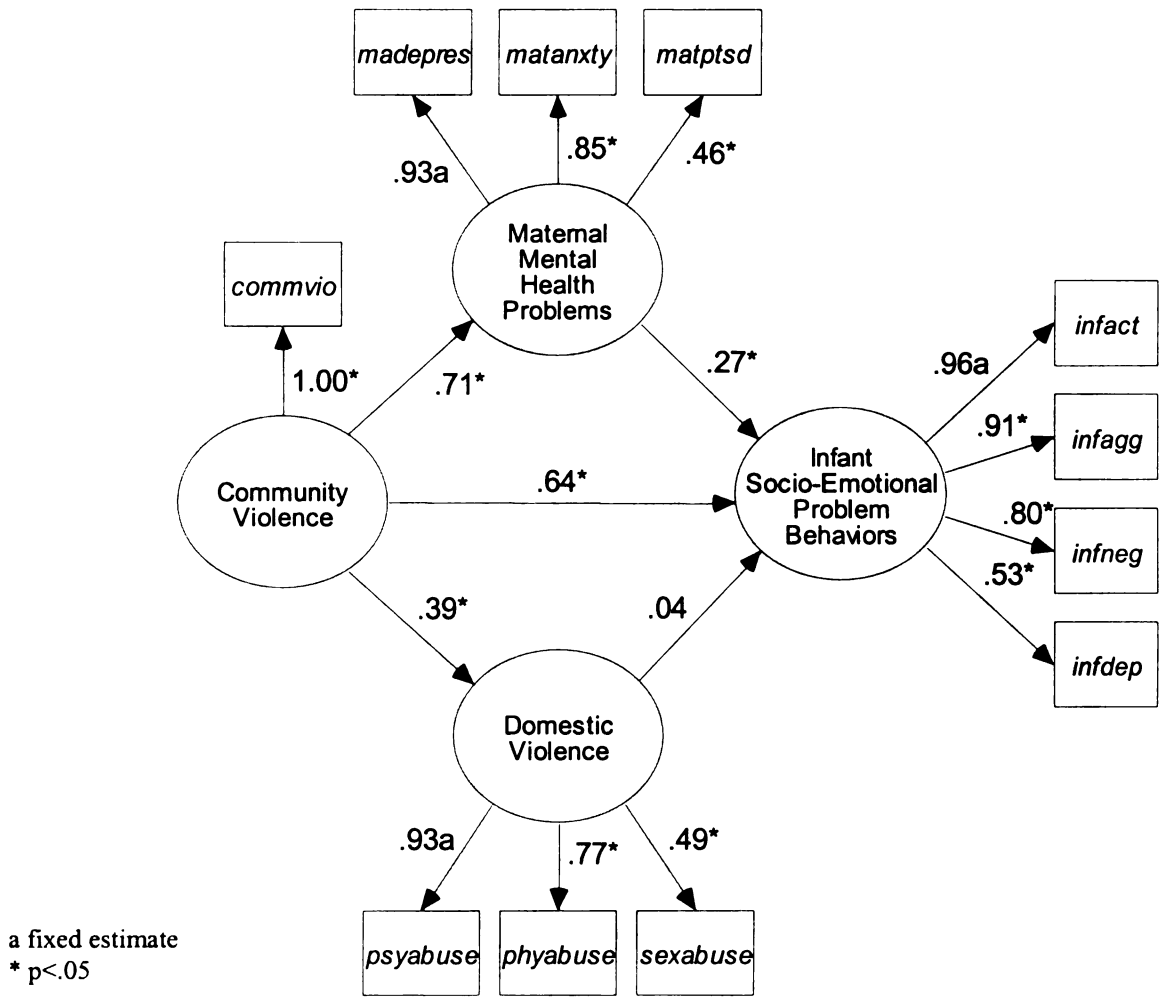

Figure 4. Completely standardized solution for hypothesized model.[4]

[4] See p. v for key to model variable names

Model Respecification

Post hoc model revisions were guided by modification indices provided by the program, provided that changes made theoretical sense. The initial hypothesized model was modified in three ways: 1) the path between Domestic Violence and Infant Social and Emotional Competence was excluded, 2) a path between Domestic Violence and Maternal Mental Health was added, and 3) the residuals between several pairs of indicators were freed to covary[5]. These changes substantially improved the model.

The final model consisted of 4 latent factors and 11 indicators (see Figure 5). The method of estimation was Maximum Likelihood (ML) and the model testing was based on the polychoric matrix of indicators (see Appendix J for the final model syntax). Parameter values for the first indicator of Maternal Mental Health, Domestic Violence, and Infant Social and Emotional Competence were fixed. All other observed variables had significant loadings on their respective factors, indicating a strong measurement model (see Figure 5 for p-values). Standardized path coefficients between indicators and factors are shown in Figure 5. Residual values for observed and latent variables can be found in Appendix K.

All paths between the latent constructs were also significant in the expected direction (see Figure 5 for p-values). Thus, as hypothesized, closer proximity to community violence was related to more social and emotional problem behaviors among infants, increased frequency and severity of domestic violence, and more maternal mental health problems. In addition, maternal mental health mediated the relationship between community violence and infant functioning, as well as the relationship between domestic

[5] Residuals for the following pairs of observed variables were estimated: 3 and 12, 4 and 10, 4 and 11, 4 and 12, 6 and 8. Refer to Table 4 for the names of these variables.

violence and infant mental health. Completely standardized path coefficients between latent variables are shown in Figure 5.

The final model fit well with the data. The RMSEA value of .079 was elevated above .05, but below .08, the obtained chi-square value, χ^2 (34, N=94) = 53.61, was non-significant at the $p<.01$ level ($p=.017$), the GFI = .91, and the NNFI = .96. Furthermore, several other fit indices were greater than .90 (see Appendix L for a complete listing of goodness of fit indices). Finally, a plot of the standardized residuals suggested a good fit as evidenced by small discrepancies between the observed and estimated residuals and by zero outliers (see Appendix M for the residual plot).

The original model and final model were compared to determine whether the final model was significantly better than the original model. The difference in chi-square values between the two models ($\Delta\chi^2$) was 73.72 while the difference in degrees of freedom (Δ df) was 6. This difference indicated a statistically significant improvement in the fit between the hypothesized and the respecified model ($p<.01$).

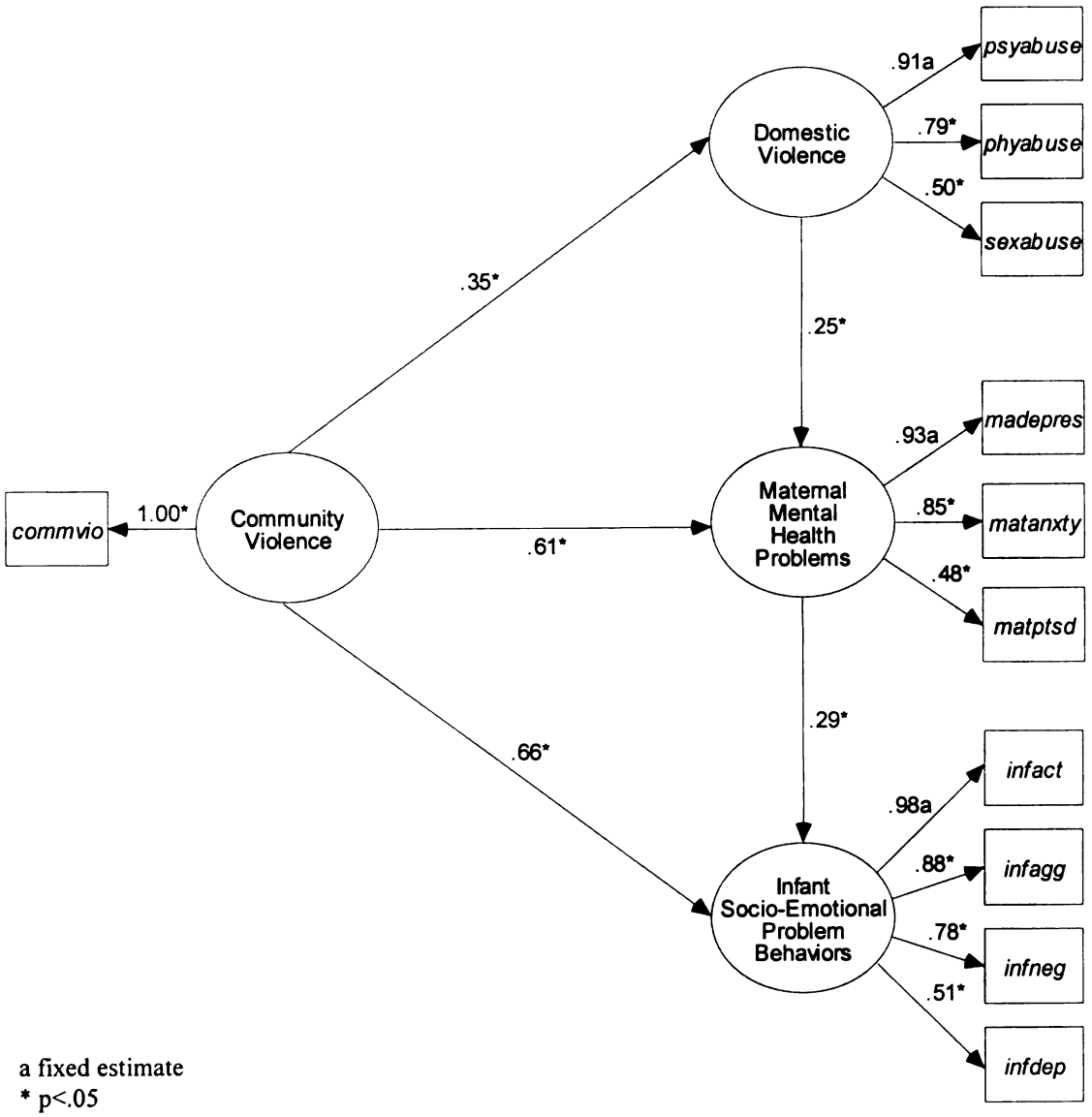

Figure 5. Best fitting model.[6]

[6] See p. v for key to model variable names

Discussion

The present study was designed to expand the focus of DV researchers by testing an ecological model of individual functioning. Guided by systems theory, which suggests that individual behavior must be conceptualized as having causes from multiple levels of ecology, a model of infant social and emotional functioning was developed to include risk factors from both the *exosystem* and *microsystem* levels. Specifically, it was hypothesized that proximity to community violence, an *exosystem* variable, would directly increase 12-month-old infants' social and emotional behavior problems. In addition, two indirect effects were hypothesized: DV and maternal mental health, both *microsystem* risk factors, were proposed to mediate the relationship between community violence and infant functioning. Structural equation modeling results are partially consistent with the hypotheses of this study, and thus, provide some support for systems theory and the testing of ecological models when examining individual behavior.

Direct Effects

Results revealed a significant relationship between community violence and infant socio-emotional functioning, confirming the hypothesis that proximity to community violence, based on police incident reports of violent crime in the community, directly increases infants' problem behaviors. Increased activity level, aggression, negative emotionality, and depression constituted problem behaviors. This result is consistent with the violence literature regarding preschool and school-age children. Previous research has documented that self-reported exposure to community violence, including witnessing and victimization of violent crimes is related to internalizing (La Greca et al., 2002; Lynch & Cicchetti, 1998; Martinez & Richters, 1993) and

externalizing (Glickman et al., 2002; Gorman-Smith & Tolan, 1998; Miller et al., 1999) behavior problems among children. Furthermore, Osofsky & Fenichel (1994), and Zeanah (1994) assert that infants exposed to community violence experience posttraumatic stress symptomatology and secondary effects, such as sleep disturbances, which may have implications for infants' mental health and the timely achievement of developmental milestones. However, this is the first known study to empirically demonstrate the direct relationship between community violence exposure and infants' social and emotional functioning, and the first to do so in the context of DV. Furthermore, community violence data is primarily collected through self-report survey methods in the existing literature (Glickman et al., 2002; La Greca et al., 2002; Lynch & Cicchetti, 1998; Richters & Martinez, 1993), whereas this is the first published study to demonstrate the relationship between community violence and infant behavior problems by considering a child's proximity to all violent crimes that occurred within the community according to police incident reports.

In addition to demonstrating that *exosystem* factors influence individual psychopathology, results show that *exosystem* factors also impact *microsystem* functioning. Just as community violence negatively impacts infants' mental health, as predicted, the results also revealed that community violence was significantly related to maternal mental health. Women living in closer proximity to violent crime occurring in the community were more likely to suffer from anxiety, depression, and posttraumatic stress symptomatology than those women living farther from community violent crime. This result is consistent with an earlier, unpublished study, which found that exposure to community violence and fear of victimization were associated with maternal depression

in a sample of at-risk mothers (Holland, 1997). However, the present study is the first to demonstrate this relationship using all incidents of violent crime occurring in the women's community according to police data. Holland's (1997) study employed a semi-structured interview to collect women's community violence exposure, which taps into women's individual experiences of violence, but is less standardized than police data collection procedures and raises the issue of individual reporting bias. Furthermore, the present investigation assessed maternal PTSD and anxiety in addition to maternal depression, which is the sole mental health outcome examined in Holland's (1997) study. Finally, Holland's (1997) study included low-income Head Start children and their mothers, whereas the present study utilized a community sample of women and children recruited through various sites within the community, thereby increasing the external validity of the findings.

The *exosystem* also influenced DV, another *microsystem* variable. As hypothesized, proximity to violent community crime was positively related to the frequency and severity of DV (as weighted by physical harm), including psychological, physical, and sexual abuse. Previous researchers have reported high levels of co-occurrence between community violence and family disruption (Sampson, 1986), including interparental violence (Richters & Martinez, 1993) and spousal conflict (Margolin & Gordis, 2000; Osofsky et al., 1993). Furthermore, Fagan et al. (1983) demonstrated a connection between community violence and the severity of DV, finding that the most violent batterers were those who also committed violent crimes outside of the home. However, the suggested link between community violence and DV, specifically, has little empirical support. Thus, this investigation is the first known study

to empirically demonstrate a direct impact of community violence on frequency and severity of DV.

Indirect Effects

In addition to finding that community violence predicts maternal mental health problems, results revealed a significant, positive relationship between maternal mental health and infant social and emotional functioning. Thus, as predicted, maternal mental health was found to mediate the relationship between community violence and infant socio-emotional functioning. This result is consistent with previous literature documenting the negative impact of poor maternal mental health on children's adjustment in domestic violence situations (Wolfe et al., 1985). For example, Pepler and Moore (Pepler & Moore, 1995) found that the most troubled children of those exposed to DV in their families were those whose mothers were experiencing depression. Furthermore, Levendosky et al. (Levendosky et al., 2000) found that maternal psychological functioning partially mediated the relationship between DV and behavior problems in preschool children. However, while earlier studies have focused on the DV and children's functioning, the present investigation is the first known study to demonstrate that maternal mental health is a mediator of the relationship between community violence and infant functioning.

Although results support the hypothesized indirect effect that maternal psychological functioning mediates the relationship between community violence and infant functioning, findings do not support the hypothesis that DV mediates the relationship between community violence and infant social and emotional functioning. While community violence is a risk factor for the occurrence of DV, the path between

DV and infant functioning was excluded in order to obtain a good model fit. However, DV was found to impact infant social and emotional functioning indirectly through maternal mental health. Thus, results suggest that maternal mental health mediates the relationship between DV and infant adjustment. This result supports the findings of several earlier studies, which document the relationship between DV and poor maternal mental health outcomes, including depression (Cascardi et al., 1992; Cascardi & O'Leary, 1992; Christopoulos et al., 1987; Kemp et al., 1991; Mitchell & Hodson, 1983; Moore et al., 1989; Wolfe et al., 1986), anxiety (Kemp et al., 1991; Moore et al., 1989; Wolfe et al., 1986), and post-traumatic stress disorder (Houskamp & Foy, 1991; Kemp et al., 1995; Kemp et al., 1991). The finding is also consistent with the work of Levendosky et al. (Levendosky et al., 2000), who found that maternal psychological functioning partially mediated the relationship between DV and children's behavior problems. However, the present investigation is the first to document this relationship with a sample of 12-month-old infants; Levendosky et al. (Levendosky et al., 2000) studied preschool children. Furthermore, the present study examined maternal anxiety in addition to maternal depression and PTSD, which were the two women's mental health outcomes included in Levendosky et al.'s (Levendosky et al., 2000) study. Thus, findings of the present study are consistent with the work of other researchers in showing that DV has a negative impact on children's social and emotional development (Fantuzzo et al., 1991; Graham Bermann, 1996; Graham Bermann & Levendosky, 1998; Grych et al., 2000; Jaffe et al., 1986; Lehmann, 1997; Levendosky et al., 2002; Mathias et al., 1995; Moore et al., 1989; Sternberg et al., 1997; Wolfe et al., 1985); however, DV appears to have an indirect

effect on children through maternal psychological functioning, rather than a direct impact.

Strengths

The present study has several strengths. First, community violence can be considered a predictor of infant functioning, DV, and maternal mental health because proximity to community violence was calculated based on violent crimes that occurred a year prior to the data collection of family and individual variables. In contrast, the majority of previous studies examining community violence collected community and individual level data occurring simultaneously. And, while some previous studies may have included self-report of prior violent events, police documented incidents are likely more accurate than an individual's memory of prior events. As a result, most studies are limited to discussing community violence as related to individual outcomes as opposed to predicting individual mental health.

In addition, in contrast to most studies that calculate community violence based on crime that occurs within an individual's neighborhood, community violence was calculated based on each participant's proximity to all violent crimes occurring within the community. This is a strength of the current study for a variety of reasons. First, neighborhoods can be operationalized in several different ways, including census tracts, face blocks, political wards, and community policing neighborhoods. Although most researchers define neighborhoods as census tracts (Coulton et al., 1995; Ernst, 2000; Miles-Doan, 1998; Queralt & Witte, 1998), census tracts may not be the best approximation of neighborhoods. Critics have suggested that census tracts are less socially cohesive and homogeneous than most researchers assume (Tienda, 1991), and

may not represent the neighborhood as residents would define it (Coulton et al., 1995). However, it is unclear as to whether city blocks or smaller spatial units, such as face blocks, are more socially cohesive than census tracts (Tienda, 1991). In addition, there is no evidence to suggest that community policing neighborhoods approximate naturally occurring neighborhoods as residents would define them. Thus, there is no consensus or gold standard in the literature regarding how to best approximate a neighborhood. Furthermore, all approximations are somewhat arbitrary. For example, houses on opposing sides of a street may not be in the same neighborhood according to certain artificial distinctions and yet, it is possible that the activities of a household on one side of the street may affect those households on the opposing side. Moreover, the individuals living in these households may consider each other to be neighbors. Finally, when using neighborhoods, it is possible for households to be closer in proximity to non-neighbors than neighbors. Thus, by eliminating the use of neighborhoods, the problem of defining a "neighborhood" is no longer an issue and all violence that may affect the child is taken into account and weighted by proximity.

Furthermore, the present study used police incident reports of violent crime as the source for community violence data, while previous studies have relied primarily on child and maternal report of community violence (Glickman et al., 2002; La Greca et al., 2002; Lynch & Cicchetti, 1998; Richters & Martinez, 1993). Police data is advantageous for two reasons: 1) it is collected by officers who are trained to collect crime information specifically, and 2) incident reports may combine information provided by mulitple informants, thereby minimizing the problem of individual reporting bias inherent in self-report data.

Limitations

While police data is a standardized and regular source of information on incidents of community crime, the use of police data also presents several measurement limitations. First, incident locations for all crimes were geocoded by the Lansing Police Department. Thus, the project investigator did not have control over data entry for crime information or match scores during the address matching process. Therefore, some measurement error is expected. Second, based on the *2000 National Crime Victimization Survey*, Rennison (2001) reported that approximately 52% of all violent crimes are not reported to the police. Thus, underreporting bias exists even though the use of police data reduces individual reporting bias because it can include information from multiple sources.

In addition to not having information available on all crimes that actually occurred within the Lansing city limits, the lack of access to criminal activity occurring outside of the Lansing jurisdiction increased the problem of "edge" effects encountered when using a geographic information system to calculate proximity to community crime. It is likely that some violent crimes occurring outside of the Lansing jurisdiction affect the participants living within the city limits. However, at this time, information on violent crimes occurring outside of Lansing is unavailable, and therefore could not be included in the calculation of community violence scores. Thus, widening the edges from the center of our target city was not possible. Regardless of whether or not expanding artificially created, jurisdictional boundaries was a possibility, however, the problem of "edge" effects could not have been completely eliminated because there will always be edges.

Finally, the use of police data is problematic because it does not capture the individual's actual experience of community violence, including the individual's awareness of the occurrence of crimes. Weighting incidents of crime by proximity provides a score that approximates the likelihood and amount of exposure to community violence, but it does not represent the severity or stressfulness of each event. It is possible that the type of crime affects each individual to a different extent and thus, should somehow be accounted for in each participant's community violence score. In the present study, only violent crimes were included in community violence score calculations as a way to reduce the variations in the severity of different crimes. Thus, all violent crimes are assumed to be severe to a similar extent.

The use of maternal report regarding community violence in addition to police data may have allowed for a closer approximation of exposure to community violence and a better understanding of each participant's individual experience of community violence; however, maternal report should not be the only source of information. The use of maternal report alone in collecting DV, maternal mental health, and child outcome data represents an additional weakness of the present study as it introduced the problem of single informant bias. Although police data may have been used as another source of DV data, the children in the current study were too young to complete self-report questionnaires, and other informants, such as mothers' partners were specifically excluded to protect the safety of the participants.

In addition to measurement errors, two other limitations are apparent. First, the small sample size is a weakness of the current study. Use of a larger sample size would have increased statistical power and may have resulted in a significant finding for the

proposed indirect effect that DV mediates the relationship between community violence and infant functioning. Finally, it is possible that community violence covaries with other *exosystem* variables that were not controlled for in the current study. In other words, community violence as measured in the present study may be a proxy for poverty, community disorder, and/or low social cohesion. Regardless of this possibility, the results of this study suggest that *exosystem* factors may account for observed relationships among lower, less inclusive levels of ecology, demonstrating the necessity of considering distal environmental influences when assessing family and individual functioning.

Intervention Implications

The findings of this study demonstrate that the *exosystem* is relevant in understanding family- and individual-level outcomes and relationships, suggesting that community variables must be targeted when developing intervention and prevention programs for batterers and victims of DV, including infants. Current interventions designed for perpetrators and victims of DV focus primarily on the individual or family environment while ignoring community-level variables. Given the findings of the current study, it is not surprising that evaluations of these programs are less than satisfactory (Hamberger & Hastings, 1993; Taylor, Davis, & Maxwell, 2001). Therefore, researchers and clinicians developing prevention and intervention programs must expand their focus to incorporate community-level variables in order to reduce the risk of DV.

In addition, as the current study suggests that community violence negatively impacts the psychological health of 12-month-old children, additional intervention programs must be designed to target infants. While several interventions have been

designed to alleviate infant-parent disturbances (Lieberman & Pawl, 1993; Lieberman, Van Horn, Grandison, & Pekarsky, 1997; McDonough, 1993), few published interventions exist that specifically address infants' reactions to violence (Osofsky, Cohen, & Drell, 1995; Zeanah, 1994). Furthermore, controlled outcome studies demonstrating the treatment efficacy of these interventions are nonexistent. In the absence of treatment efficacy studies, interventions should continue to be developed accounting for current research findings regarding the symptomatology and disorders that infants exposed to violence exhibit. Existing interventions for infants target individual and family variables (e.g., temperament, parental distress, parenting skills), while the findings of this study suggest that community factors (e.g., neighborhood violence, neighborhood disadvantage, neighborhood social cohesion, etc.) need to be considered.

Directions for Future Research

As systems theory and an ecological framework suggest, the present study demonstrates that the *exosystem* must be accounted for in DV research. However, the current study is only a preliminary investigation of the influence of the *exosystem* on *microsystem* functioning. The findings need to be replicated to assure that the results are not sample specific, and larger sample sizes should be employed to increase statistical power.

Similarly, results of the present study confirm initial indications that DV and community violence negatively impact infants. However, additional research to further substantiate the current findings, and research on younger infants as well as other developmental outcomes needs to be conducted, as the sample size of the current study

only allowed for the testing of a few problem behaviors in the wide range of infant social and emotional functioning.

In addition, the combined use of police data and maternal report on community violence measures is suggested to establish a better understanding of women and children's experiences of violence. Likewise, the measurement of DV should include police data in addition to maternal report as the two sources may provide different data. Thus, multiple sources of information should be used to gather data for each construct.

It is also recommended that additional *exosytem* factors be tested in models of DV. Although the present study incorporated risk factors for infants' functioning from multiple levels of ecology, only one *exosystem* factor was evaluated: community violence. Other community-level factors, such as community disorder, community resources, neighborhood poverty, neighborhood social cohesion, neighborhood transiency, school environment, and peer relationships should be included in DV analyses. Examination of additional *exosystem* variables will allow researchers to conclude whether or not other community-level variables affect family and individual functioning, as well as to disentangle the effects of various community-level factors.

Finally, all ecological levels should be included in DV research. Although the present study moves beyond individual and family factors to evaluate the broader community in the context of DV, societal and cultural variables, such as norms for violence and willingness to tolerate violence, could also be considered as theory and research suggest that the interplay of all ecological forces is relevant to understanding functioning at each level of ecology. Thus, to enhance our understanding of DV and

mental health outcomes as a result of experiencing or witnessing DV, researchers must carefully assess all of the links in the complex chain of influence.

APPENDICES

Appendix A

Recruitment Flyers

HAVE YOU BEEN HURT BY SOMEONE YOU LOVE?

ARE YOU PREGNANT AND HAVE YOU BEEN PUSHED OR GRABBED OR HIT OR SLAPPED OR KICKED (OR WORSE) BY A PARTNER OR BOYFRIEND DURING YOUR PREGNANCY?

We need women to take part in an interview about their lives and their pregnancies.

- Interview can be done at MSU or at your home.
- You will be paid **$50.00** in cash.
- All information is kept completely confidential.

!! $50.00 !!

****

If you are interested or would like more information, please call **432-1447** and ask for

Mother-Infant Study

MOTHER-INFANT STUDY **432-1447**	**MOTHER-INFANT STUDY** **432-1447**	**MOTHER-INFANT STUDY** **432-1447**	**MOTHER-INFANT STUDY** **432-1447**	**MOTHER-INFANT STUDY** **432-1447**

ARE YOU PREGNANT?

YOU MAY BE ELIGIBLE TO PARTICIPATE IN A STUDY ABOUT
MOTHER-INFANT RELATIONSHIPS

!! $50.00 !!

We are looking for pregnant women **due before April 1, 2000** to participate in a research study at Michigan State University. You will be asked about experiences and feelings during pregnancy, perceptions of your infants, and recent life events.

- Interview can be done at MSU or at your home.
- You will be paid **$50.00** in cash.
- All information is kept completely confidential.

!! $50.00 !!

****

If you are interested or would like more information, please call **432-1447** and ask for
Dr. Anne Bogat's Mother-Infant Study

Appendix B

Demographic Questionnaire

From T1:

1. Your date of birth: __ __ / __ __ / __ __ (mo) (dy) (yr)

15. What is your racial or ethnic group? (Circle one)
    1 = Native American
    2 = Asian American/Pacific Islander
    3 = Black, African American
    4 = Latino, Hispanic, Chicano
    5 = Biracial (mixed): Specify_____
    6 = Caucasian, White
    7 = Other: _____

16. What is the baby's father's racial or ethnic group? (Circle one)
    1 = Native American
    2 = Asian American/Pacific Islander
    3 = Black, African American
    4 = Latino, Hispanic, Chicano
    5 = Biracial (mixed): Specify_____
    6 = Caucasian, White
    7 = Other: _____

From T2:

1. What date was your baby born? _____ _____ _____ Month Day Year

3. Is your baby a (circle one) **Boy or Girl**?

From T3:

1. Name of child: _____

2. Child's bithdate: _____

3. Since you gave birth to _____ (name of child), have you had any:

YES NO (a) miscarriages
YES NO (b) still births
YES NO (c) abortions
YES NO (d) other children

4. Are you currently pregnant? **YES NO**

5. How many biological children do you currently have? _____

6. How many people, including yourself, live in your household? _____
(If participant is living in a shelter, questions 6 & 7 refer to household composition before moving into shelter.)

7. Please list these: (Write in specific relationship to mother. Be specific--is the person (for ex.) a husband, stepfather, biological child, foster child, or partner's child?)

self _____ _____ _____ _____

_____ _____ _____ _____

_____ _____ _____ _____

8. Choose the one that best describes your current marital/relationship status (choose only one):

(1) single, never married
(2) married (a) For how long? _____ (in months)
(3) separated (b) For how long? _____ (in months)
(4) divorced (c) For how long? _____ (in months)
(5) widowed (d) For how long? _____ (in months)

9. When we interviewed you during your pregnancy, you had been involved with _____ [name of T1 partner] for at least six weeks during the pregnancy. What has happened to this relationship since we interviewed you then? (Read all choices and circle one)

   (1) I am still in a relationship with him.
   (2) We have been together off and on since the interview, and we are currently together.
   (3) We have been together off and on since the interview, and we are currently not together.
   (4) I have not had a relationship with him since the interview.

10. Since the birth of your baby, please list the first names of the people with whom you had a romantic relationship that lasted at least 6 weeks. Please start with the most recent or current relationship and go back in time. Include the person listed in Question #9 *(T1 partner)* if appropriate.

10a. _____ Was this person the same person you were involved with when we last interviewed you? **YES NO**
Is this person the father of your baby? **YES NO**
Are you currently involved? **YES NO**

Anyone else?

10b. _____ Was this person the same person you were involved with when we last interviewed you? **YES NO**
Is this person the father of your baby? **YES NO**
Are you currently involved? **YES NO**

Anyone else?

10c. _____ Was this person the same person you were involved with when we last interviewed you? **YES NO**
Is this person the father of your baby? **YES NO**
Are you currently involved? **YES NO**

Anyone else?

10d. _____ Was this person the same person you were involved with when we last interviewed you? **YES NO**
Is this person the father of your baby? **YES NO**
Are you currently involved? **YES NO**

Anyone else?
(Interviewer: If there are other partners, please list them on the back of page and ask the 3, yes/no questions for each partner.)

11. What is your current relationship with the father of your baby? (Circle one)
    1 = spouse
    2 = ex-spouse
    3 = partner/fiancé
    4 = ex-partner
    5 = friend
    6 = acquaintance
    7 = stranger
    8 = other Please specify: _____

12. Is the baby's father involved with the baby? **YES NO**

13. Does the baby's father live with the baby? **YES NO**

14. Does the baby live with you? **YES NO**

    If NO, who does the baby live with? _____
    (relationship of person to mother)

15. What is your religious affiliation? _____

16. Do you currently work outside the home? **YES NO**

    If NO, did you work outside the home anytime during the last year? **YES NO**

17. Do you currently work at home (e.g., daycare provider or home office)?
    YES NO

18. [*If YES to either part of Questions 18 and 19*]: What is/was your occupation?

_____

- *Please be specific. For example, bookkeeper, cashier, computer programmer.*
- *If there were two jobs/occupations, have participant choose the one that she feels best represents her occupation.*

19. What is the highest level of education you have completed? (Circle one)

a. Grade: 1 2 3 4 5 6 7 8 9 10 11 12 13=GED
b. Some college
c. Trade School (Cosmetology, Nursing, Technical/Vocational)
d. AA degree
e. BA/BS
f. Some grad school
g. Graduate degree
   1. MA? ____
   2. Ph.D.? ____
   3. Law? ____
   4. MD? ____

20. Have you been in school during the last year? **YES NO**

If YES, please describe: _____
_____

21. Does your current partner work outside the home? (Circle one)
   1. 1 = YES
   2. **2 = NO**
   3. **888 = not applicable; no current partner**

If YES, what is his occupation? _____
(Please be specific)

22. What is the highest level of education your current partner/spouse has completed? (Circle one)

a. Grade: 1 2 3 4 5 6 7 8 9 10 11 12 13=GED
b. Some college
c. Trade School (Cosmetology, nursing, Technical/Vocational)
d. AA degree
e. BA/BS
f. Some grad school
g. Graduate degree
   1. MA? ____
   2. Ph.D.? ____
   3. Law? ____
   4. MD? ____
h. **Not applicable = 888**

23. What is your total family income per month (estimate)? _____

24. Do you currently receive services from . . . ?

a. WIC	**YES**	**NO**
b. AFDC	**YES**	**NO**
c. Protective Services	**YES**	**NO**
c. Food Stamps	**YES**	**NO**
d. Medicaid	**YES**	**NO**
e. SSI (Disability)	**YES**	**NO**
f. FIA cash assistance/grant	**YES**	**NO**
g. Any child related programs (e.g., 0-3; Mother-Infant Program; Head Start)?	**YES**	**NO**

25. Are you currently residing in a shelter for battered women?
    (a) **YES NO**/888
    (b) If **YES**, # days?_____

26. Since **(child's name)** was born, have you stayed in a shelter for battered women?
    (a) **YES NO**/888
    (b) If **YES**, # days? _____

27. Since **(child's name)** was born, have you stayed in a homeless shelter?
    (a) **YES NO**/888
    (b) If **YES**, # days? _____

Appendix C

ITSEA

Please answer the following questions about your child's behavior using the following scale: (0) ***Not true/rarely:*** (1) ***Somewhat true/sometimes:*** and (2) ***Very true/often***. Try to answer all questions, even if some of the behaviors seem too young or too old for your child. If you can't judge whether your child does one of the behaviors listed, mark "***No Opportunity***" to observe.

	Not true/ Rarely	**Somewhat true/ sometimes**	**Very true/ often**	**No Opp.**
1. Is restless and can't sit still.	0	1	2	n/o
2. Gets very "wound up" or silly when playing.	0	1	2	n/o
3. Is constantly moving.	0	1	2	n/o
4. Seems to be driven by a motor.	0	1	2	n/o
5. Is very loud. Shouts or screams a lot.	0	1	2	n/o
6. Goes from toy to toy faster than other children his/her age.	0	1	2	n/o
7. Gets hurt more than other children.	0	1	2	n/o
8. Gets hurt so often that you can hardly take your eyes off him/her.	0	1	2	n/o
9. Acts aggressive when frustrated.	0	1	2	n/o
10. Acts bossy.	0	1	2	n/o
11. Misbehaves to get attention from adults.	0	1	2	n/o
12. Is disobedient or defiant.	0	1	2	n/o
13. Is sneaky. Hides misbehavior.	0	1	2	n/o
14. Is "hard to handle."	0	1	2	n/o
15. Is stubborn.	0	1	2	n/o
16. Has a short fuse. Gets mad easily.	0	1	2	n/o
17. Hits, shoves, kicks, or bites children or adults.	0	1	2	n/o
18. Is aggressive with you (or other parent).	0	1	2	n/o
19. Has temper tantrums.	0	1	2	n/o
20. Throws or pushes away things s/he does not want.	0	1	2	n/o

	Not true/ rarely	Somewhat true/ sometimes	Very true/ often	No Opp.
21. Fights with other children.	0	1	2	n/o
22. Is mean to other children on purpose.	0	1	2	n/o
23. "Tests" other children to see if they will get angry.	0	1	2	n/o
24. Hurts other children on purpose.	0	1	2	n/o
25. Picks on or bullies other children.	0	1	2	n/o
26. Takes toys away from other children.	0	1	2	n/o
27. Tries to get other children mad or upset.	0	1	2	n/o
28. Teases other children.	0	1	2	n/o
29. Often gets very upset.	0	1	2	n/o
30. Is impatient or easily frustrated.	0	1	2	n/o
31. Cries a lot.	0	1	2	n/o
32. Is irritable or grouchy.	0	1	2	n/o
33. Gets angry or pouts.	0	1	2	n/o
34. "Spaces out." Is totally unaware of what's happening around him.	0	1	2	n/o
35. Does not make eye contact.	0	1	2	n/o
36. Avoids physical contact.	0	1	2	n/o
37. Keeps feelings to self.	0	1	2	n/o
38. Laughs and smiles less than other children.	0	1	2	n/o
39. Has less fun than other children.	0	1	2	n/o
40. Looks unhappy or sad without any reason.	0	1	2	n/o
41. Seems withdrawn.	0	1	2	n/o
42. Seems very unhappy, sad, or depressed.	0	1	2	n/o

Appendix D

PTSD Scale

INTERVIEWER:
1. If participant did not have a partner in the past year, do not administer, and mark "X" here _____.
2. Participant should complete this scale only if they endorse at least one item on the SVAWS. If no items were endorsed on that scale, check here and skip this page _____. (code as 888)

On the previous pages, we asked you how many times your partner(s) engaged in some specific behaviors with you. *(Interviewer: Show participant the SVAWS.)* As a result of these acts, please circle how many times you had each of the following problems.

1. Unpleasant memories of the behaviors you can't keep out of your mind.
Never 1-2 3-11 12-24 25-36 37-50 51-100 Over 100 times
2. Upsetting dreams about the behaviors.
Never 1-2 3-11 12-24 25-36 37-50 51-100 Over 100 times
3. Suddenly acting or feeling as if the behaviors were happening when they weren't.
Never 1-2 3-11 12-24 25-36 37-50 51-100 Over 100 times
4. Very upset when exposed to something reminding you of the behaviors.
Never 1-2 3-11 12-24 25-36 37-50 51-100 Over 100 times
5. Trying to avoid thoughts or feelings associated with the behaviors.
Never 1-2 3-11 12-24 25-36 37-50 51-100 Over 100 times
6. Trying to avoid activities or situations that remind you of the behaviors.
Never 1-2 3-11 12-24 25-36 37-50 51-100 Over 100 times
7. Not able to remember important parts of the behaviors.
Never 1-2 3-11 12-24 25-36 37-50 51-100 Over 100 times
8. Much less interest in important activities since the behaviors.
Never 1-2 3-11 12-24 25-36 37-50 51-100 Over 100 times
9. Feeling detached from others since the behaviors.
Never 1-2 3-11 12-24 25-36 37-50 51-100 Over 100 times
10. Not having your normal range of feelings since the behaviors (for example, not able to have loving feelings).
Never 1-2 3-11 12-24 25-36 37-50 51-100 Over 100 times
11. Since the behaviors, having a sense that you do not have long-range plans.
Never 1-2 3-11 12-24 25-36 37-50 51-100 Over 100 times
12. Difficulty falling or staying asleep.
Never 1-2 3-11 12-24 25-36 37-50 51-100 Over 100 times
13. Irritability or outbursts of anger.
Never 1-2 3-11 12-24 25-36 37-50 51-100 Over 100 times
14. Difficulty concentrating.
Never 1-2 3-11 12-24 25-36 37-50 51-100 Over 100 times
15. Being overly alert.
Never 1-2 3-11 12-24 25-36 37-50 51-100 Over 100 times
16. Very easily startled.
Never 1-2 3-11 12-24 25-36 37-50 51-100 Over 100 times
17. When near something or someone that reminds you of the behaviors you have a physical reaction, such as shaking or sweating.
Never 1-2 3-11 12-24 25-36 37-50 51-100 Over 100 times

Appendix E

BSI-A

Below is a list of problems and complaints that people sometimes have. Read each one and select the number that best describes **how much discomfort that problem has caused you during the past week, including today**.

0= not at all 1=a little bit 2=moderately 3=quite a bit 4=extremely

How much were you distressed by:

_____ 1. Nervousness or shakiness inside

_____ 2. Suddenly scared for no reason

_____ 3. Feeling fearful

_____ 4. Feeling tense or keyed up

_____ 5. Spells of terror or panic

_____ 6. Feeling so restless you couldn't sit still

Appendix F

BDI

In answering these questions, think about each item carefully and circle the answer out of the group of 4 items that best reflects how you have been feeling **during the past week.**

1. [1] I do not feel sad.
   [2] I feel sad.
   [3] I am sad all the time and I can't snap out of it.
   [4] I am so sad or unhappy that I can't stand it.

2. [1] I am not particularly discouraged about the future.
   [2] I feel discouraged about the future.
   [3] I feel I have nothing to look forward to.
   [4] I feel that the future is hopeless and that things cannot improve.

3. [1] I do not feel like a failure.
   [2] I feel I have failed more than the average person.
   [3] As I look back on my life, all I can see is a lot of failures.
   [4] I feel I am a complete failure as a person.

4. [1] I get as much satisfaction out of things as I used to.
   [2] I don't enjoy things the way I used to.
   [3] I don't get real satisfaction out of anything anymore.
   [4] I am dissatisfied or bored with everything.

5. [1] I don't feel particularly guilty.
   [2] I feel guilty a good part of the time.
   [3] I feel quite guilty most of the time.
   [4] I feel guilty all of the time.

6. [1] I don't feel I am being punished.
   [2] I feel I may be punished.
   [3] I expect to be punished.
   [4] I feel I am being punished.

7. [1] I don't feel disappointed in myself.
   [2] I am disappointed in myself.
   [3] I am disgusted with myself.
   [4] I hate myself.

During the past week . . .

8.
[1] I don't feel I am any worse than anybody else.
[2] I am critical of myself for all my weaknesses or mistakes.
[3] I blame myself all the time for my faults.
[4] I blame myself for everything bad that happens.

9.
[1] I don't have any thoughts of killing myself.
[2] I have thoughts of killing myself, but I would not carry them out.
[3] I would like to kill myself.
[4] I would kill myself if I had the chance.

10.
[1] I don't cry any more than usual.
[2] I cry more now than I used to.
[3] I cry all the time now.
[4] I used to be able to cry, but now I can't cry even though I want to.

11.
[1] I am no more irritated by things than I ever am.
[2] I am slightly more irritated now than usual.
[3] I am quite annoyed or irritated a good deal of the time.
[4] I feel irritated all the time now.

12.
[1] I have not lost interest in other people.
[2] I am less interested in other people than I used to be.
[3] I have lost most of my interest in other people.
[4] I have lost all of my interest in other people.

13.
[1] I make decisions about as well as I ever could.
[2] I put off making decisions more than I used to.
[3] I have greater difficulty in making decisions than before.
[4] I can't make decisions at all anymore.

14.
[1] I don't feel that I look any worse than I used to.
[2] I am worried that I am looking old or unattractive.
[3] I feel that there are permanent changes in my appearance that make me look unattractive.
[4] I believe that I look ugly.

15.
[1] I can work about as well as before.
[2] It takes an extra effort to get started at doing something.
[3] I have to push myself very hard to do anything.
[4] I can't do any work at all.

During the past week . . .

16. [1] I can sleep as well as usual.
[2] I don't sleep as well as I used to.
[3] I wake up 1-2 hours earlier than usual and find it hard to get back to sleep.
[4] I wake up several hours earlier than I used to and cannot get back to sleep.

17. [1] I don't get more tired than usual.
[2] I get tired more easily than I used to.
[3] I get tired from doing almost everything.
[4] I am too tired to do anything.

18. [1] My appetite is no worse than usual.
[2] My appetite is not as good as it used to be.
[3] My appetite is much worse now.
[4] I have no appetite at all anymore.

19. [1] I haven't lost much weight, if any, lately.
[2] I have lost more than five pounds.
[3] I have lost more than ten pounds.
[4] I have lost more than fifteen pounds.

20. [1] I am no more worried about my health than usual.
[2] I am worried about physical problems such as aches and pains, or upset stomach, or constipation.
[3] I am very worried about my physical problems and it's hard to think of much else.
[4] I am so worried about my physical problems that I cannot think about anything else.

21. [1] I have not noticed any recent change in my interest in sex.
[2] I am less interested in sex than I used to be.
[3] I am much less interested in sex now.
[4] I have lost interest in sex completely.

Appendix G

Severity of Violence Against Women Scales

*****This questionnaire refers to _____ [NAME, see page 2, Question 10]*****Use a separate form for each partner listed on page 2, Question 10

INTERVIEWER: If participant did not have a romantic partner in the last year, do not administer: code all answers as "X." INSTRUCTIONS: You and your partner have probably experienced anger or conflict. Below is a list of behaviors he may have done. Describe how often he has done each behavior to you during the last year and how many times your baby saw or heard what happened by choosing a letter from the following scale.

A	BB	C	D	X
never	once	a few times	many times	no partner during last year

During the last year:

↓ *Times your baby saw or heard what happened:* ↓

1. ____ ____ Hit or kicked a wall, door or furniture
2. ____ ____ Threw, smashed or broke an object
3. ____ ____ Driven dangerously with you in the car
4. ____ ____ Threw an object at you
5. ____ ____ Shook a finger at you
6. ____ ____ Made threatening gestures or faces at you
7. ____ ____ Shook a fist at you
8. ____ ____ Acted like a bully toward you
9. ____ ____ Destroyed something belonging to you
10. ____ ____ Threatened to harm or damage things you care about
11. ____ ____ Threatened to destroy property
12. ____ ____ Threatened someone you care about
13. ____ ____ Threatened to hurt you
14. ____ ____ Threatened to kill himself

15. ____ ____ Threatened you with a club-like object

16. ____ ____ Threatened you with a knife or gun

17. ____ ____ Threatened to kill you

18. ____ ____ Threatened you with a weapon

19. ____ ____ Acted like he wanted to kill you

20. ____ ____ Held you down, pinning you in place

21. ____ ____ Pushed or shoved you

22. ____ ____ Shook or roughly handled you

23. ____ ____ Grabbed you suddenly or forcefully

24. ____ ____ Scratched you

25. ____ ____ Pulled your hair

26. ____ ____ Twisted your arm

27. ____ ____ Spanked you

28. ____ ____ Bit you

29. ____ ____ Slapped you with the palm of his hand

30. ____ ____ Slapped you with the back of his hand

31. ____ ____ Slapped you around your face and head

32. ____ ____ Kicked you

33. ____ ____ Hit you with an object

34. ____ ____ Stomped on you

35. ____ ____ Choked you

36. ____ ____ Punched you

37. ____ ____ Burned you with something

38. ____ ____ Used a club-like object on you

39. ____ ____ Beat you up

40. ____ ____ Used a knife or gun on you

41. ____ ____ Demanded sex whether you wanted to or not

42. ____ ____ Made you have oral sex against your will

43. ____ ____ Made you have sexual intercourse against your will

44. ____ ____ Physically forced you to have sex

45. ____ ____ Made you have anal sex against your will

46. ____ ____ Used an object on you in a sexual way

47. Were you ever pregnant during the time that any of these events occurred?

(1) *yes* (2) *no* (888) *n/a*

Appendix H

Consent Form – Time 3

Thank you for participating in the first two interviews for this study. This study is part of a survey of women in Michigan, some of whom may be experiencing domestic violence. We hope to learn about the strengths that you bring to your situation, your feelings, your perceptions of your baby, and your relationships with others, including family members, partners, and friends. We hope to use this information to help plan better programs for families experiencing domestic violence.

If you decide to take part in the survey today, you will be asked questions about how you have been feeling recently, events that have happened to you in the last year, and your feelings about your baby and the people in your life who provide support for you. You will also be asked to participate in some play with your baby that will be videotaped. Your baby will also play with some toys and games with an interviewer for about an hour. The total interview will take about 3-4 hours. You will be paid $75 for your participation and you will also receive a toy for your baby.

All information that you give us will be kept strictly confidential among the project staff. Your name or your baby's will not be on any questionnaires and videotapes; an identification number will be put on them instead. All questionnaires and videotapes will be kept in locked file cabinets in a locked office. Your identity will not be revealed in any reports written about this study. We will summarize information from all study participants and will not report information about yourself or any individuals. Your privacy will be protected to the maximum extent allowable by law.

The only exception to full confidentiality is in the case of ongoing child abuse or neglect. If you indicate that child abuse or neglect is occurring in your household, we are required to make a report to Child Protective Services. We would inform you if we thought we needed to make such a report.

You have the right to refuse to answer any questions or to withdraw from this study at any point during the interview with no penalty or negative consequences. Your decision about whether to participate or not will not affect your relationship with any agencies or Michigan State University. If you have any questions, please ask us. If you have any questions about the study later, you can contact Dr. Anne Bogat or Dr. Alytia Levendosky at (517) 432-1447. If you have questions about your rights as a participant in this research study you may contact Dr. David Wright at 355-2180.

We may be interested in recontacting you 2 years after the birth of your baby. At the end of the interview today, we will ask you to update the contact information that we have for you. Your participation today does not obligate you to participate in any future interviews.
I have read this form and agree to participate.

_____	_____
Signature of Participant	Date
_____	_____
Witness	Date

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Appendix I

Table 5

Correlation Matrix of Model Variables[7]

	commvio	*matdepre*	*matanxty*	*matptsd*	*infact*	*infagg*	*infneg*	*infdep*	*psyabuse*	*phyabuse*	*sexabuse*
commvio	1.000										
matdepre	-0.057	1.000									
matanxty	-0.011	0.639*	1.000								
matptsd	0.101	0.176	0.328*	1.000							
infact	0.013	0.087	-0.002	0.062	1.000						
infagg	-0.127	0.108	0.075	0.080	0.491*	1.000					
infneg	-0.030	0.014	0.047	0.131	0.509*	0.611*	1.000				
infdep	0.068	0.224*	0.182	0.152	0.328*	0.328*	0.346*	1.000			
psyabuse	-0.049	0.130	0.193	0.585*	0.081	-0.085	0.075	-0.018	1.000		
phyabuse	-0.129	0.091	0.141	0.583*	0.041	-0.080	0.070	-0.035	0.709*	1.000	
sexabuse	0.120	0.085	0.404*	0.531*	-0.184	0.019	0.016	-0.080	0.380*	0.455*	1.000

[7] See p. v for key to model variable names

Appendix J

Lisrel 8.52 Syntax for Final Model

```
Impact of CV on infants' social and emotional competence
DA ni=12 no=94 ma=pm
LA
CV T3SUMBDI T3SUMBSI T3SUMPTS T3ITSACT T3ITSAGG
T3ITSPEE T3ITSNEG T3ITSDEP TOTVWS1 TOTVWS2 TOTVWS3
RA fi=missingwrcv.txt ma=am
se
2 3 4 5 6 8 9 10 11 12 1/
mo nk=1 nx=1 ne=3 ny=10 ph=fr ps=sy,fi td=sy,fi te=sy,fi ga=fu,fi lx=fr be=fu,fi
pa ly
3(1 0 0)
4(0 1 0)
3(0 0 1)
va 1 td 1 1
fr te 1 1 te 2 2 te 3 3 te 4 4 te 5 5 te 6 6 te 7 7 te 8 8 te 9 9 te 10 10
fr ps 1 1 ps 2 2 ps 3 3
fr ga 1 1 ga 3 1 ga 2 1
fr be 2 1 be 1 3
fr th 1 6
fr te 6 5 te 9 3 te 8 3 te 10 3 te 10 2
le
MMH ISH DV
lk
CV
pd
ou rs tv mi me=ml sc ad=off it=500
```

Appendix K

Table 6

Standardized Residuals[8]

	commvio	*matdepre*	*matanxty*	*matptsd*	*infact*	*infagg*	*infneg*	*infdep*	*psyabuse*	*phyabuse*	*sexabuse*
commvio	0.02										
matdepre	0.39	0.00									
matanxty	-0.24	0.13	0.07								
matptsd	0.68	-1.08	1.10	0.01							
infact	0.06	0.15	-1.01	0.21	0.00						
infagg	-0.30	0.57	-0.19	0.47	0.00	0.00					
infneg	-0.27	-0.74	-0.76	0.74	0.00	0.06	0.06				
infdep	-0.68	1.02	0.69	1.00	-0.22	0.83	1.53	0.00			
psyabuse	1.32	0.30	0.93	0.03	1.60	0.42	1.05	-0.05	0.06		
phyabuse	-1.68	-1.92	-0.96	0.10	-0.89	-1.43	-0.31	-0.91	0.07	0.05	
sexabuse	0.67	-0.04	0.51	1.20	-0.71	0.23	0.08	-0.78	-0.27	1.68	0.79

[8] See p. v for key to model variable names

Appendix L

Goodness of Fit Statistics

Degrees of Freedom = 34
Minimum Fit Function Chi-Square = 59.51 (P = 0.0044)
Normal Theory Weighted Least Squares Chi-Square = 53.61 (P = 0.017)
Estimated Non-centrality Parameter (NCP) = 19.61
90 Percent Confidence Interval for NCP = (3.56 ; 43.58)

Minimum Fit Function Value = 0.64
Population Discrepancy Function Value (F0) = 0.21
90 Percent Confidence Interval for F0 = (0.038 ; 0.47)
Root Mean Square Error of Approximation (RMSEA) = 0.079
90 Percent Confidence Interval for RMSEA = (0.034 ; 0.12)
P-Value for Test of Close Fit (RMSEA < 0.05) = 0.12

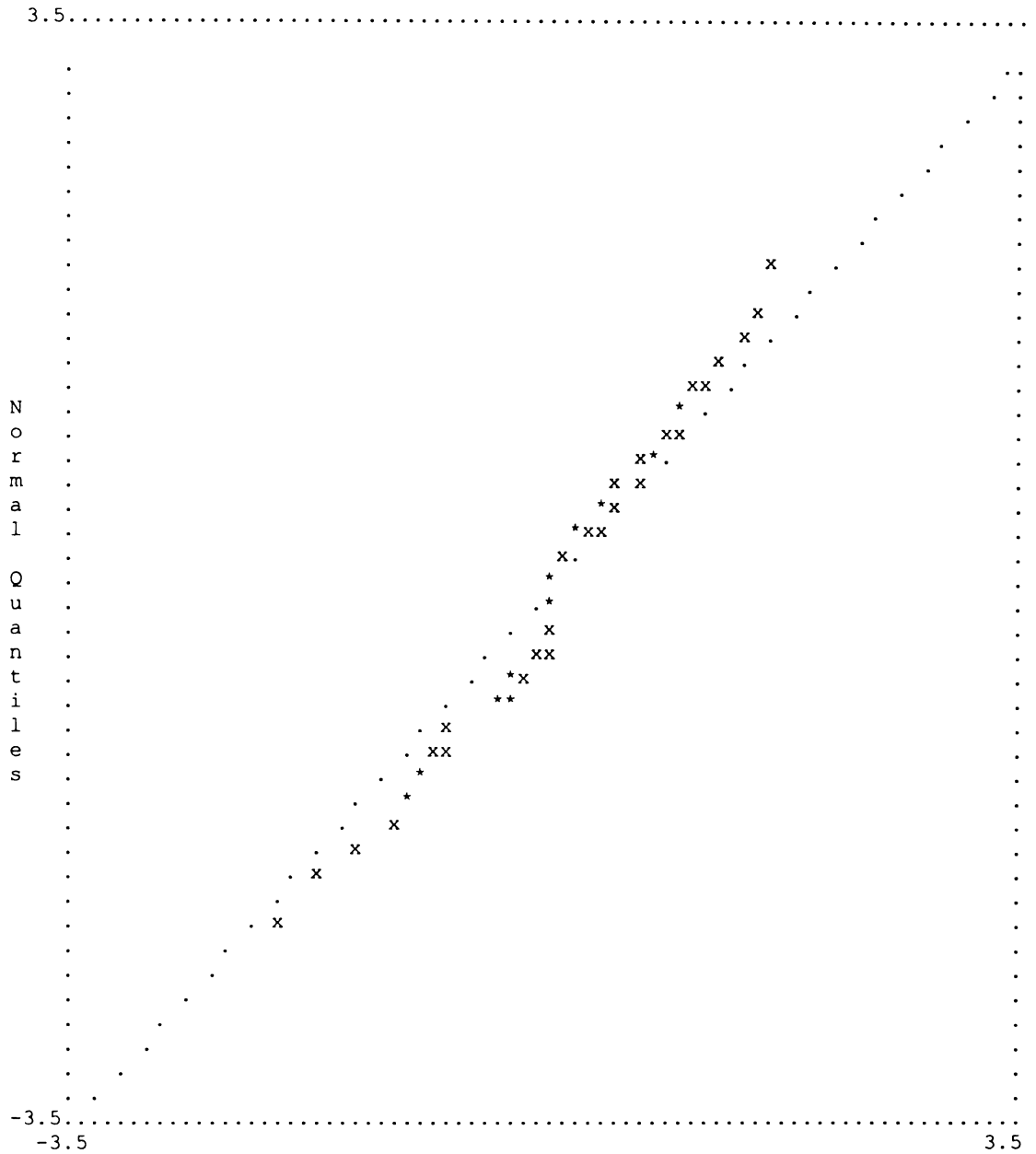
Expected Cross-Validation Index (ECVI) = 1.26
90 Percent Confidence Interval for ECVI = (1.09 ; 1.52)
ECVI for Saturated Model = 1.42
ECVI for Independence Model = 13.03

Chi-Square for Independence Model with 55 Degrees of Freedom = 1189.59
Independence AIC = 1211.59
Model AIC = 117.61
Saturated AIC = 132.00
Independence CAIC = 1250.57
Model CAIC = 230.99
Saturated CAIC = 365.86

Normed Fit Index (NFI) = 0.95
Non-Normed Fit Index (NNFI) = 0.96
Parsimony Normed Fit Index (PNFI) = 0.59
Comparative Fit Index (CFI) = 0.98
Incremental Fit Index (IFI) = 0.98
Relative Fit Index (RFI) = 0.92

Critical N (CN) = 88.61
Root Mean Square Residual (RMR) = 1350.13
Standardized RMR = 0.054
Goodness of Fit Index (GFI) = 0.91
Adjusted Goodness of Fit Index (AGFI) = 0.82
Parsimony Goodness of Fit Index (PGFI) = 0.47

Appendix M



Standardized Residuals

Figure 6. Q-plot of standardized residuals.

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